
**UNIVERSITÀ DEGLI STUDI DI PISA**

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# *"Implementation of Safety Management System in an Helicopters Maintenance Organization"*

*LAUREANDA*

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# *SUMMARY*

This thesis is about the Safety Management System implementation in an aeronautic maintenance organization and its purpose is to write a manual that can get the approbation of the national aeronautic authority, ENAC.

The draft of the manual is the result of the collaboration with Helicopters Italia s.r.l, a maintenance organization for Eurocopter (now Airbus Helicopters) helicopters located in the airport G. Caproni of Trento.

At first it was necessary to search and study the documentation about the regulation about Safety Management System in aeronautic organizations, then I could begin to write the manual. For most of the part of this manual there are guideline suggested by the aeronautic authorities, but every organization have to ideate a way to manage safety hazard and risks characterizing its activity and that could threaten the flight mission.

I suggest to manage safety hazards and do the risks and their associated outcomes assessment using some tables. My intent is to have a table that help to imagine the scenarios that can originate from an hazard, think about the barriers to avoid it and to react to it to limit the consequences of them, in case the barriers did not work and collect all the information in a synthetic and clear way, to be understandable even in future for other people from the author, because risk assessment is a dynamic process.

To help me to find witch was the hazard in the maintenance activities, I few days at Nucleo Elicotteri of the Provincia of Trento, during a 200 flight hours inspection on an Agusta Westland 139 and a replacement of servo controls on a AS 350 B3.

At the end, I manage to have a little hazard and outcome log, that are only the beginning of a risk management, that in the time will increase, but is a basis for a continuous analysis that will lead in the future an effective Safety Management System and safer flight activity.

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## Part I

# *PART I*

## *Safety management system*

# 1. INTRODUCTION

According to the definition of the Safety Management Manual of ICAO, *safety* is the condition in which the possibility of damage to people or properties is reduces and kept under an acceptable level through a continuous process of hazard identification and risk management.

The Safety Management System (SMS) is based on an organized approach of safety management an effective SMS allows the hazard identification that could have consequences on the activities of the company, the assessment of the risks linked to those hazards and the individuation of priorities to be able to carry out proper mitigation measures to reduce the risks to a level as low as reasonably possible and acceptable.

The structure and the contents of SMS are essentially the same for every organization, but the details of the structure, the procedures to apply and the documentation should reflect the dimension, the complexity and the level of risk of the organization.

A company, to implement and organize a SMS, have to produce a document containing all the forms and procedures for the analysis of risks and safety: the Safety Management System Manual.

Before writing the manual, it was necessary to study the regulation regarding SMS, explained in the first four chapters, and understand how it can be implemented in an organization (chapter 5).

Subsequently, in chapters 6, 7, and 8, there is a short explanation of the characteristic elements of a SMS: safety assurance and promotion and hazard and risk management.

The last chapter explains haw the manual is checked and approved by the national authority.

Part II contains the manual, which chapter reflect the index suggested by all the aeronautic safety agencies, and the annexes there are all the documentation and the analysis I produces during my thesis period and from which the organization can start the continuing process of safety risk management and SMS.

# 2. AVIATION SAFETY AGENCIES

## 2.1 ICAO

Based in Montréal, Canada, the International Civil Aviation Organization is an agency of the United Nations appointed of the development of principles and techniques for international air navigation, routes and airports and promote the development of a safer and more orderly international air transport.

The ICAO Council adopts standards and recommended practices concerning air navigation, its infrastructure, flight inspection, prevention of unlawful interference, and facilitation of border-crossing procedures for international civil aviation. ICAO defines the protocols for air accident investigation followed by transport safety authorities in countries signatory to the Convention on International Civil Aviation, the Chicago convention.

The organization establishes two types of rules: the standard rules and the recommended practice or Annexes.

## 2.2 FAA

Born in 1958 as Federal Aviation Agency, changes its name in Federal Aviation Administration in 1967. Together with the European Aviation Safety Agency is one of the major agency in the world responsible for the new aircraft certification.

FAA is the national aviation authority of the United States and oversees all the aspects of American civil aviation.

The FAA prescribes the Federal Aviation Regulations (FARs), that are rules governing all the aviation activities in the United States. The rules are designed to promote safe aviation, protecting pilots, flight attendants, passengers and the general public from unnecessary risk.

## 2.3 From JAA to EASA

The European Parliament consider the aeronautic industry, and the aerospace one in general, a source of strategic value and define it as fundamental for the European Union for its interesting technologic, economics and defensive aspects. So it is important for the European countries to collaborate in this sector, because none of them alone have available enough means of research and production and trades to be competitive in the world.

The continuing growth of the air traffic and the importance of the themes of quality, safety and environmental conservation led to the need of new regulation and national and supernational organizations.

In 1970 was founded the Joint Aviation Authorities (JAA) who group countries in the common goal of cooperation and development of European regulation to improve quality and safety of air traffic. From 1987, the JAA began to rule over maintenance, certifying and project aspects.

Then the member countries felt the need to have an independent organization with legal authority (JAA does not have it) to rule the aviation safety. They wanted to give to the civil aviation common rules for the safety levels, quality standards, environmental compatibility, goods circulations and cooperation with third countries.

So, on the 15 July 2002 the publication of the regulation (CE) n. 1592/2002 on the Official Journal of the European Union, born the European Aviation Safety Agency (EASA) and it reached full functionality in 2008.

EASA is based in Cologne, Germany, and counts thirty-two member states: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxemburg, Malta, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, The Netherlands and The United Kingdom.

There are, furthermore, other not-European nations that adopt EASA rules and procedures on voluntary basis.

The work of the European Aviation Safety Agency centers on ensuring the highest levels of civil aviation safety, through certification of aviation products, approval of organizations to provide aviation services, development and implementation of a standardized European regulatory framework.

The EASA responsibilities include to conduct analysis and research of safety, authorizing foreign operators, giving advice for the drafting of EU legislation, implementing and monitoring safety rules (including inspections in member states), giving type-certification on aircraft and components as well as the approval of organizations involved in the design, manufacture and maintenance of aeronautical products.

EASA is tasked to provide a review of aviation safety on an annual basis. The Annual Safety Review presents statistics on European and worldwide civil aviation safety. EASA has access to accident and statistical information collected by ICAO. States are required, according to ICAO Annex 13 on Aircraft Accident and Incident Investigation, to report to ICAO information on accidents and serious incidents to aircraft with maximum take off mass over 2250 kg. Therefore, most statistics in this review concern aircraft above this mass. In addition of ICAO data, a request was made to the EASA member states to obtain light aircraft accident data. Furthermore, data on operation of aircraft for commercial air transport was obtained from both ICAO and NLR Air Transport Safety Institute.

## 2.4 ENAC

ENAC (Ente Nazionale per l'Aviazione Civile) is the Italian authority for technical regulation, certification and surveillance of civil aviation.

Among others tasks, ENAC have to manage the relationships with national and international organization that operate in the civil aviation and represent Italy in the international meetings.

Every rule approved by EASA have to be accepted and introduced by ENAC in the Italian regulation and ENAC have also to give the aeronautic company the procedures to conform with the European standards.

# 3. THE REGULATION

The regulation 1592/2002, updated and replaced with the 216/2008 is defined Basic Regulation. It contains common rules for civil aviation.

The aeronautic activities are all grouped in categories and the Basic Regulation prescribe to every category to make the common enter in force. for this purpose there are regulation of secondary level, included in Annexes. The figure below shows a scheme of the regulation.

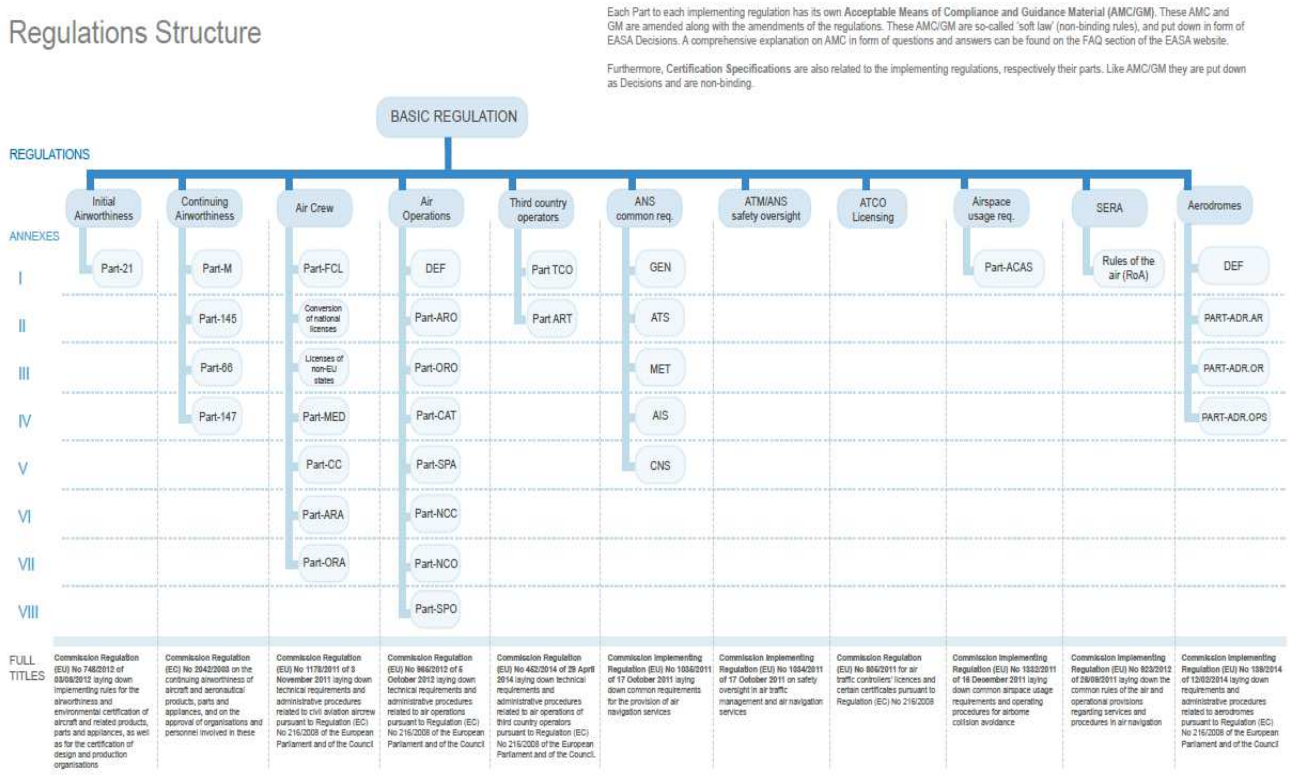


**Figura 3.1 Basic regulation**

The Basic Regulation is applied, for initial and continuous airworthiness, by two regulations of secondary level, the 748/2012 and the 1321/2014. They are called Implementation Rules and are composed by an article and one or more documents called Parts.

In the article are defined the application field, the objective, the period of transition between the old regulation (JAR) and the new one and the date of coming in force.

Every Part is divided in two section: the section A illustrates the requirements requested to the aeronautic subject and in the section B the ones required to the competent authority.

The 748/2012 secondary level regulation rules the certifying process of aeronautic products and production and design companies. It define as aeronautic product aircrafts, engines and propellers. Every instrument, equipment, part, annex or accessory used for the aircraft control during the flight and installed on the aircraft is called part. The Implementation rule contains the Part 21, that defines the requirements and procedures for the certification of the aircraft, the products and the parts and of the production (subpart G) and design (subpart J) organizations.
In this Rule there are also the Certification Specifications (CS), that guarantee the uniform application of the common regulations.

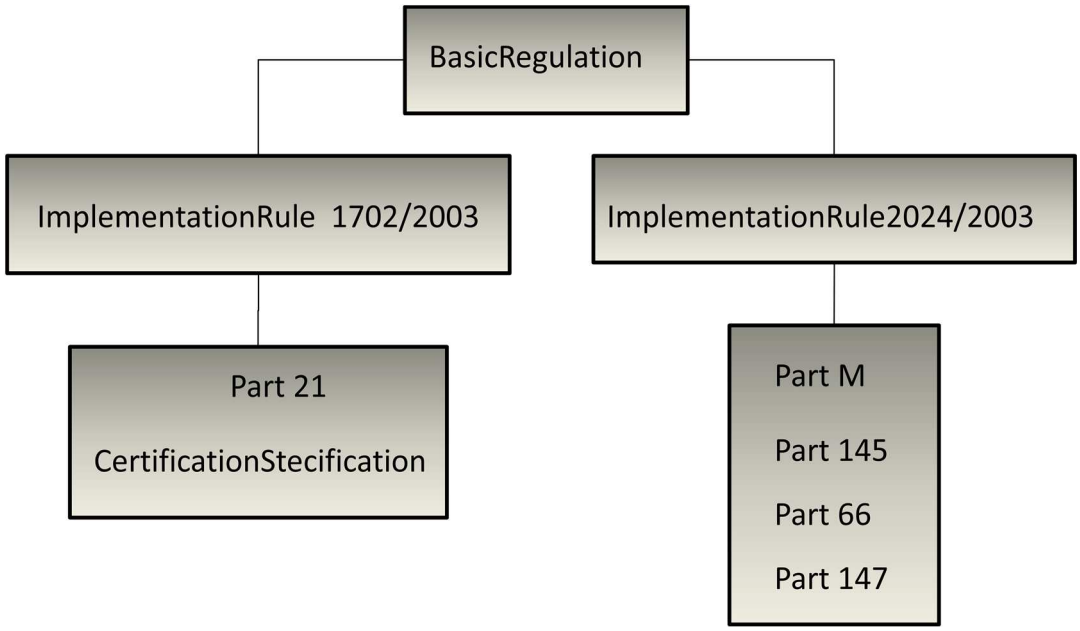


**Figure 3.1Regulation structure for initial and continuing airworthiness**

The other Implementation Rule (1321/2014) is about the continuing airworthiness of the aeronautic products and the certification of the companies and the maintenance personnel. It is composed by four Parts:

- Part M: for the continuing airworthiness of aeronautic products;
- Part 145: for the certification of the maintenance companies;
- Part 66: for the aeronautic maintenance licenses;
- Part 147: for the certification of the technical training schools for the maintenance personnel.

The EASA Chief Executive can separately publish explanatory notes or additional information for every Part in the form of Decisions and they are called Acceptable Means of Compliance (AMC) and Guidance Materials (GM).

## 3.1 Part 145 certified companies

In 1992 came in force the regulation Joint Aviation Requirements 145, o JAR 145 that ruled the maintenance activities for public transport aircrafts. Then the JAR 145 was replaced with the Part 145 of the EASA regulation.

In Europe are settled about the 95% of the maintenance companies of the world. So it is reasonable to think that the European standards will expand in the world in the future.

Italy is at the fourth place in Europe for the number of maintenance companies, after United Kingdom, France and Germany.

To obtain approval to be an aeronautical repair station, an organization must write, submit and keep updated a Maintenance Organization Exposition (MOE). To support their MOE they must have a documented set of procedure. Thirdly the organization must have a compliance matrix to show how they meet the requirements of Part 145.

# 4. SAFETY MANAGEMENT SYSTEM

Safety Management System (SMS) is a term used in several fields to indicate a plan to manage the safety inside a complex reality, like a company or an airport.

A SMS provides a systematic way to identify hazard and control risks while maintaining assurance that these risk controls are effective.

SMS can be defined as a systematic and organized approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures. As with all management system, a safety management system provides for goal setting, planning and measuring performances. A safety management system is woven into the fabric on an organization. It becomes part of the culture, the way people do their jobs.

At the present time, the SMS is used in the most advanced industrial sectors because it permits to keep constant in time values of protection and production of a system. N this way it is possible to avoid un desirable situation, such us incidents and financial loss.

Civil aviation is certainly one of the industrial sectors more influenced by technological evolution and trade growth. So SMs can offer relevant opportunities of growth and improvement.

For the purposes of defining safety management, safety can be defined as the reduction of risk to a level that is as low as is reasonably practicable.

The component of SMS within which hazards identification take place is safety risk assessment and this forms part of an overall safety risk management process. Safety risk assessment can be performed on steady-state operations to provide assurance that the risk associated with day-to-day operations remain tolerable safe. It can also be performed on proposed changes to a system or operation to ensure that the risk from any additional hazards or any impacts on existing hazards, introduced by the change remain acceptably safe.

There are three imperatives for adopting a safety management system for a business. These are ethical, legal and financial.

There is an implied moral obligation placed on an employer to ensure that work activities and the place of work to be safe, there are legislative requirements defined just about every jurisdiction on how this is to be achieved and there is a substantial body of research which

shows that effective safety management can reduce the financial exposure of an organization by reducing direct and indirect costs associated with accident and incidents.

To address these three important elements, an effective SMS should:

- Define how the organization is set up to manage risk;
- Identify risk and implement suitable controls;
- Implement effective communications across all levels of the organization;
- Implement a process to identify and correct non-conformities;
- Implement a continual improvement process.

In a SMS there is an important role of the Authority. The Authority has indeed a double role of controller for the system and promoter of a positive safety culture, which purpose is to promote in the controlled subjects an explicit and systematic management philosophy and put the national safety on an higher level.

The presence of the Authority is, however, not sufficient to change the mentality of an aeronautic company. The aeronautic history teaches that the authority regulation is a necessary, but not sufficient condition to keep standard safety levels, because human factor is the most important, but even the weakest link of a safety chain.

## 4.1 Basic safety-management components

Since there are many models to choose from to outline the basic components of a SMS and all of them use different terminology, the process and the workflow for SMS is always the same with the same basic components:

- Safety policy and indicators: establish within policy elements what the requirements are for the organization in terms of resources, defining management commitments and defining targets;
- Organizing: how is the organization structured, where are responsibilities and accountabilities defined, who reports to who and who is responsible for what;
- Planning and implementation: what legislation and standards apply to the organization, what objectives are defined and how are these reviews, hazard prevention and the assessment and management of risk;
- Hazard identification and safety risk management;

- Safety assurance;
- Evaluation: how is performance measured and assessed, what are the processes for the reporting of accidents and incidents and for the investigation of accidents and what internal and external audit processes are in place to review the system;
- Action for improvement: how are preventive and corrective action managed and what processes are in place to ensure the continual improvement process;
- Safety promotion.

## 4.2 Regulatory perspective

A SMS is intended to act as a framework to allow an organization, as a minimum, to meet its legal obligation under occupational health and safety law. The structure of a SMS is generally speaking, not of itself a legal requirement but it is an extremely effective tool to organize the myriad aspects of occupational safety and health that can exist within an organization, often to meet standards which exceed the minimum legal requirement.

A SMS is only as good as its implementation; effective SMS means that organizations need to ensure they are looking at all the risks within the organization as a single system, rather than having multiple, competing safety management silos.

From 2006, the ICAO realized many regulationsand promotional actions to introduce the SMS requirements in ICAO Annexes 11, 14 and 6 and recently in ICAO Annexes 1 and 13.

Particularly, Annex 6 prescribes the introduction of a SMS for operators and maintenance companies within 1st January 2009.

To follow the ICAO, the EASA is including in the European regulations the obligation of SMS for operators and maintenance companies.

In Italy, The ENAC in 2005 emended a document including the guidelines for the adoption of SMs for all the aeronautic companies, and other documents in 2007, 2008 and 2013.

# 5. SAFETY MANAGEMENT SYSTEM IMPLEMENTATION

There are a number of industry sectors worldwide which have recognized the benefits of effective safety management. The regulatory authorities for these industries have developed safety management systems specific to their own industries and requirements, often backed up by regulation.

The International Civil Aviation Organization has recommended that all aviation authorities implement SMS regulatory structures. ICAO has provided resources to assist with implementation, including the ICAO Safety Management Manual. Unlike the traditional occupational safety focus of SMS, the ICAO focus is to use SMS for managing aviation safety.

The ICAO High-level Safety Conference 2010 recommendation 2/5 proposed the development of a new Annex (19) dedicated to Safety Management. The Annex was published in February 2013 and entered into force on November 14, 2013. The benefits identified of this approach included:

- Address safety risks proactively;
- Manage and support strategic regulatory and infrastructure development;
- Re-enforce the role played by the State managing safety at the State level, in coordination with service providers;
- Stress the concept of overall safety performance in all domains.

The United States has introduced SMS for airports through an advisory circular and other guidance.

The United states announced at the 2008 EASA/FAA International Safety Conference that they would be developing regulations to implement SMS for repair station, air carriers and manufactures. The FAA formed a rulemaking committee to address the implementation. This committee reported its findings to the FAA on march31, 2010. The Report recognizes that many of the elements of SMS already exist in the US regulations, but that some elements do not yet exist. A draft of what the US SMS rule might look like was proposed by one trade association that participated in the committee. Currently, the FAA is supporting voluntary pilot projects for SMS.

The FAA has also required that all the FAA services and offices adopt common Aviation Safety (AVS) Safety management System (AVSSMS). This is what ICAO calls a State Safety Program.

The FAA published a Notice of Proposed Rulemaking (NPRM) for the establishment of SMS for air carriers. That NPRM explains that it is intended to serve as the foundation for rules that would later be applied to Part 135 operators, Part 145 repair stations and Part 21 manufacturers. Several US trade association filed comments in response to air carrier NPRM. Among these comments were arguments for developing separate SMS regulation for other certificate holders, in order to make sure that safety management remains a usable tool for advancing safety, rather than a uniform and useless paperwork exercise. In addition, the FAA has also filed a NPRM for SMS for airports, which would be separate from the rules for SMS for air carriers.

The EASA began the process of implementing SMS regulations by issuing Term of Reference on July 18, 2011. That was followed by a Notice of Proposed Amendment issued on January 21, 2013. The proposed EASA regulation would apply to repair station, but would have significant ancillary effect on other aviation industry sub-sectors.

To introduce SMS in the Italian legislation, ENAC have to refer to the following European regulations:

- UE regulation N. 1178/2001 of 3th of November 2011, like emended by the UE regulation N. 290/2012 of 30th of march 2012, section ORO.GEN.200;
- UE regulation N. 965/2012 of 5th October 2012 , section ORA.GEN.200.

Both these regulations are labeled “Management System”.

## 5.1 Applicability

The SMS is applicable to operators, aero medical centers and airworthy personnel training organizations.

In prevision of the emendation of a European regulation for the contents of the NPA EASA n. 2013-01, the SMS is applicable even to repair station and continuous airworthiness management organization.

## 5.2 Safety policy and objectives

### 5.2.1 Management accountability and engagement

To be effective, a SMS need financial and human resources allocation. To this purpose is necessary that the company management to prove engagement and take the accountability of the SMS of the organization.

This engagement for the safety is expressed by a formal safety policy communicated to the whole organization. The policy establishes a clear high-leveled address for the organization to manage safety in an effective and proactive way and it is approved by the Accountable Manager.

The safety policy has to underline the engagement of the organization for safety and its proactive and systematic management. It has to prove the engagement of the senior management in reaching the highest levels of safety and to allocate proper resources to manage safety in an effective way and reduce the risk to a level as low as reasonably possible.

An other task of the safety policy is to encourage all the personnel to take actively part and satisfy all the aspects of the SMS and prove the intention to observe all applicable the requirements and standards.

In the safety policy are included the principle of safety reporting and is underlined the purpose of it and the internal investigation as mean of improvement of safety and not to lay the fault to someone. In this way the safety policy have to supply a safety culture inside the different components of the organization of the company.

The whole personnel should know the safety policy and its behavior should reflect this acknowledgement.

The Accountable Manager should actively prove his engagement for the safety policy to give his contribute to the creation of a positive safety culture inside the organization, essential for the SMS success. It is also very important for the safety policy to be specific and representative of the organization.

### 5.2.2 Safety accountabilities

It is necessary for the structure of management of the organization, the tasks and the accountabilities of the Accountable Manager and of the safety key personnel to be clearly defined.

The Accountable Manager has the whole accountability on SMS, therefore he has to have:

- The firm authority to secure that all the activities could by financed and carried out according to the requested standards;
- The whole authority and the resources to secure a proper staff;
- The direct accountability on the organization activities carry out;
- Accountability on the safety objectives and targets;
- The final accountability to solve all the safety questions and problems.

### 5.2.3 Appointment of the safety key personnel

The organization have to identify a Safety Manager, who has to take the role of focal point for the SMS. He has the task to coordinate the SMS and respond directly to the Accountable Manager.

It is important to notice that the accountability for the SMS is of the Accountable Manager and not of the Safety Manager. This latter is accountable for the development, the administration and the keeping of SMS.

The typical function of the Safety Manager are described in the Acceptable Means of Compliance of Parts ORA and ORA.

The Safety Manager should acquire competence and qualification through courses on aeronautic regulation, on safety, risk, quality management and auditing techniques, on analysis and investigation of aeronautic events, on human factor, etc., and through a proved and wide experience in one or more sectors of quality, operative safety, flight operation, technical management, maintenance and/or training of aeronautic companies.

The candidate for the role of Safety Manager should have acquired a detailed acknowledgement and familiarity with procedures and activities of the organization he works for.

Because of the complexity and the wideness of the subjects who are of competence of the Safety Manager, this figure has to have management capacity for the analysis and the problem solving, the diplomacy and the flexibility.

The regulation does not prescribe a specific degree or minimum period of experience for the Safety Manager, but it is clear that a good knowledge of the aeronautic safety is needed.

In not complex organizations, the Accountable Manager can take the role of the Safety Manager to, if the load of work is not excessive.

The company have to suggest to ENAC the Safety Manager with the apposite form, in which ENAC can find all the information needed. Then there will be a interview to prove the knowledge and the experience of the candidate.

It is important, the safety key personnel to meet regularly to discuss safety questions. If the organization is complex the Safety Manager could be supported by the Safety Review Board and a Safety Action Group.

The Safety Review Boardis headed by the Accountable Manager and composed by all the responsible for all the functional areas. It monitors the safety performances and the effectiveness of SMS. The Safety Action Group carries out specific activities for the implementation of all the components of SMS.

### 5.2.4 Emergency response plan coordination

An emergency response plan lists the action that have to be adopted by the organization or the single person in case of emergency.

Usually we think about an emergency response plan for flight operation or aerodromes, but it is applicable even to other types of organization, like repair station. For example we can think about a serious violation of the requirements of airworthiness by a repair station that takes as consequence the need to recall on ground all the interested aircrafts.

A well structured emergency response plan ensures:

A ordered and effective transition from the normal operation to the emergency ones;

The designation of an authority for the emergency;

The assignation of accountabilities and responsibilities in emergency situation;

The documentation of the emergency procedure;

The coordination of the efforts to solve emergency;

The safety keeping of the operation or the return to the normal activities, as soon as practicable;

The coordination with the emergency response plans of other organization, if present.

The emergency response plan defines the accountabilities and responsibilities, the roles and the action to be taken by the different sectors and person involved in the emergency management. It can include check lists and the details of the contacts and it is periodically reviewed and tested. The safety key personnel should have easy access to the emergency response plan in every moment.

The emergency response plan should be allowable and known by the whole personnel and regularly put into practice to ensure that everybody know his responsibilities and the actions requested and have the competence to actuate the proper actions in case of emergency.

### 5.2.5 SMS documentation

All SMS aspects have to be clearly documented to keep a tidy record of the reasons that led to certain decisions and the respective action taken by the company. The documentation has to be checked and prepared in a proper format to be clearly understood by the personnel of the company and by the contracted companies.

The SMS documentation includes:

- The safety policy and the safety objectives of the SMS;
- The accountabilities of the Accountable Manager and the safety key personnel;
- The processes, the procedures and the checklists about safety;
- The results and the consequent actions of safety audits and assessment;
- The results of all risk assessment ant the mitigation adopted;
- The hazard log.

It is possible to create a separately safety management system manual or to document the SMS in other manuals of the company (for example the operation manual or the training manual).

The system used for the management of the record has to be reliable and safe; if the company uses informatics systems it is needed regular back ups of files as protection against alterations. The systems should allow an easy access and information availability.

# 6. HAZARD IDENTIFICATION AND SAFETY RISK MANAGEMENT

The risk management process begins with the identification of the hazards which affect the safety of the organization and the assessment of the associated risks.

An hazard can be intended as a condition, event or circumstance that could bring or contribute to a undesirable or unforeseen event. The ECAST "Guidance on hazard identification" gives the following definition:

*Hazard: a condition, object, activity or event with the potential of causing injuries to personnel, damage to equipment or structures, loss of material, or reduction of ability to perform a prescribed function.*

The risk is the potential result of an hazard and it is expressed in terms of likelihood and severity of the consequences, considering the worse situation that could be foreseen. The ECAST document gives the following definition:

*Risk: the combination of the predicted frequency and severity of the consequences of hazard(s) taking into account all of the potential outcomes.*

Generally it can be sad that an hazard is something (condition, object, etc) in the present and the associated risk is a potential result of the present condition that can happen in the future. Moreover, has to be reminded that to an hazard are usually associated more than only one dangerous consequences, which have different level of risk.

Nest are listed some example of hazard:

- For operators: adverse meteorological conditions, intense traffic, birds in the take off /landing path, mountains in the nearby of the airport, unusual terminology, new equipments, cockpit reconfiguration, operational fatigue, partial failure or navigation instruments loss, radio communication loss, etc;
- For maintenance activity: unclear work instruction, check instrument not well working, improper management of the communication between the turns, inadequate training/recourses/ability, fuel vapors from open tanks, etc;
- For training activity: error in the instrument interpretation, error in taxiway/runway identification, insufficient competence, few familiarity with the terminology and training area, etc;

When the risk level is identified, appropriated corrective action or mitigation measures can be implemented to reduce the risk a level as low as reasonably possible.

It is important to observe that these mitigation measures have to be monitored to ensure that they have the desired effect.

## 6.1 Safety reporting

The hazards can be controlled only if their existence is known. Through a system of safety reporting it is possible to identify the situations or condition that have the potential to threat the safety of the aircraft operations.

The company have to actively encourage the voluntary internal reporting, even of the less significant inconvenient that that inconvenient for which ENAC request a report (that can be classified as “minor problem”), because is very useful for the organization. In this way it is possible to monitor the safety performances of the organization and identify a safety trend.

All the personnel of the organization and the organization with which it has business should take part actively in the system of safety reporting. All the interested parts should have clearly understand how to do a report, what to report and to who address it. The information contained in the reports, can then be used to identify the safety risks and make possible the implementation of corrective actions.

The information have to be used for the purpose of improving safety, to of blaming who does an error. To encourage the reporting without frighten the personnel to be blamed, it is important that the personnel feels that there is an open and right culture in the organization. So it is necessary for the organization studying a right, confidential clear and easy to use safety reporting system. In such a system, the personnel has not to be punished for not voluntary or intentional errors. Otherwise, the organization should study the reasons of these errors to learn a safety lesson. It is also important to give a feedback to the person who did the hazard or inconvenient report.

## 6.2 Hazard identification

An hazard identification process is the instrument to collect, record and analyze the safety hazard for the operational activities of the organization. In a mature SMS, the hazard identification is a continuous work.

The organization has to do a initial hazard identification to create a basis to refer to, an hazard log, that has to be continuously updated.

Some of the more common hazard identification methods are:

- Brainstorming sessions, when the members of the Safety Action Group or a group of competent persons identify the hazards;
- Techniques like HAZOP (hazard and operability study) or SWIFT (structured what-if) where is used a more systematical and structured approach than brainstorming;
- Examination of previous incidents or inconvenient data;
- Reports from operative, maintenance, training or auditing activities;
- Analysis and monitoring of flight data;
- Internal and external safety reports (voluntary and compulsory);
- Internal or external audits and safety assessment;
- Safety information from external sources, like authorities and investigation agencies;
- Information given by the builder of the used aircraft or similar;
- General hazard checklists.

The hazard identification has to be done in a continuous way and every time there is a significant changing and the possibility to create a new risk.

## 6.3 Risk assessment and mitigation

The risk assessment process permits to classify the risks considering their potential. So it is possible to define the priorities in locating the resources in an effective way.

It is important to involve in the process persons with a proper competence an experience. In fact the result of the process depends of both the quality of the information used and the knowledge and competences of who does the assessment.

After the hazard identification is needed an assessment in terms of potential damage. So are assessed the severity and the likelihood of the event.

To every hazard can be linked more than only one risk. In this case the risk assessment has to be done for every associated risk.

The risk assessment and mitigation processes analyze and eliminate, or reduce to an acceptable level, the risks that could treat the safety of the activity. The information given by the analysis should be distributed to everyone in the organization who has safety responsibility or accountabilities.

## 6.4 Severity, likelihood and tolerability

The severity has to be assessed thinking about the worse realistic possible scenario considering the present mitigation measures.

To define the severity can be useful the following questions:

- Are deaths possible (crew, passengers, etc)?
- Which are the probable damages to the aircraft and to the properties and the financial damages?
- What is the probable environment impact (fuel loss, natural habitat destruction, etc)?

The risk is assessed even in terms of likelihood, always considering the present mitigation measures.

To define the likelihood can be useful the following questions:

- There are cases of similar events in the past (in the company or in others) or is an isolated event?
- Which other similar aircrafts, equipment or components could have the same defect?

- How many people are involved in the activities and what is its frequency?
- Which are the measures taken to prevent the happening of the event and what is their effectiveness?

After the assessment of severity and likelihood, the risk can be valuated using a tolerability matrix that define the organization criteria of tolerability of risk.

## 6.5 Risk mitigation

Risks have to be managed to lead them to a level as low as reasonably possible. The level of risk should be equilibrated in relation with time, coasts and the difficulty of taking actions to reduce or eliminate the risk. A risk level can be lowed in three different ways:

- Reducing the severity of the potential consequences;
- Reducing the likelihood or the frequency;
- Reducing the exposure to the risk.

A corrective action should consider the eventual existent defenses and their incapacity to reach an acceptable risk level. The action will be object of further valuations to understand if the residual risk is now acceptable and verify that no other risk have been introduced in the operative activities.

Mitigations have to be monitored to ensure their effectiveness in the time.

Mitigation strategies can be grouped in two categories:

- Elimination: the operation or activity is canceled or avoided because the safety risk is bigger than the benefits produced continuing the activity, eliminating completely the risk;
- Reduction: the frequency of the operations or activities is reduced or the entity of the consequences is reduced (for example doing the operation only during the day);

## 6.6 Hazard log

All the identified hazards which could have some impact on safety, the risk assessment and the following action taken have to be clearly documented. The nature and format of this documentation can vary from a simply register to a sophisticated data base that link hazards with mitigations, accountabilities and actions.

A simply way to document hazards is to create an hazard log. The log contains all the identified hazards, the associated risks, the results of risk assessment considering the existent mitigation measures, further eventual risk mitigation measures and, if necessary, a new risk assessment to verify if the measures have been effective.

The hazard log is a work document and should be periodically reviewed, especially during the Safety Board meetings.

# 7. SAFETY ASSURANCE

Safety assurance is all the processes and activities with which the organization verifies the performance and the effectiveness of SMS, if the safety objectives and requirements have been achieved and ensure the continuous improvement.

Safety assurance process is complementary with the compliance monitoring one, both prescribe analysis, documentation, auditing and valuations to ensure to satisfy the safety objectives. While the second one focuses on the requirement compliance of the organization, safety assurance monitors specifically the effectiveness of safety risk mitigations (safety controls)

## 7.1 Safety performance monitoring and measure

To manage the safety performance of the organization it is necessary to measure them. Therefore is needed to have safety data and individuate which performance indicators use, the targets to achieve and the frequency of the measurements.

A safety performance indicator is a parameter to measure how safe is the organization. Every organization have to individuate its indicators.

## 7.2 Management of change

The organization activities can frequently change. Therefore it is necessary to implement a process to identify potential hazards due to significant changes and assess the impact on safety.

Changes include, for example:

- Introduction of new equipment;
- Changes in operations;
- Introduction of new aircrafts and routes;
- Introduction of new services;
- New procedures;
- Changes in safety key personnel.

Some useful questions to identify the hazards linked to change are:

- Are the existent documentation and procedures adequate or it is necessary to modify them?
- Is the personnel properly trained?
- Do the organization costumers know the changes?

## 7.3 Continuous improvement of SMS

SMS should be part of the organization, dynamic and aim to the continuous improvement of the organization safety performance. In case of SMS safety performance under the standards the organization has to identify the causes and adopt the necessary measures to eliminate or mitigate the gap.

## 7.4 Compliance monitoring

Aeronautic regulation requires, as part of the organization management, the institution of a compliance monitoring function. This function has to be independent to ensure that the system will be effective and operative.

For reasons of continuity with the preexistent regulations, the compliance monitoring function reconfigures the activities of the quality system.

The function has to elaborate a Compliance Monitoring Program that contains the verify of all the requirements compliances in regular intervals of time, through audits and inspection. It is

required that the personnel who has the task to audit and inspect has no accountability for the function, procedure or product that is inspected.

In not complex organization, audits and inspections can be done by external auditors or organizations. In this case the organization is anyway accountable to ensure that the external personnel has the proper competence an experience for the audit and verification activity.

To ensure the safety it is necessary to monitor the respect of the procedures, monitoring at least:

- The company privileges;
- The documentation, including manuals and records;
- Training standards;
- Management system manuals and procedures.

Audit should include even valuation about third organizations that interface with the organization and could have impact on safety.

The accountability of the compliance monitoring system has to be taken by a compliance monitoring manager, with a profile and functions that permit:

- Direct access to Accountable Manager;
- Incompatibility with the task of accountable for a functional area of the organization;
- Direct access to all the structures of the organization and, if necessary, of the contracted ones;
- Proper knowledge, cultural basis and experience for the activity.

In not complex organizations this task can be taken by the Accountable Manager, provide he/she demonstrates to have proper competence and that the work load is not excessive to permit to do both the tasks.

The Compliance Manager is proposed to ENAC using an opposite form. With this form, and in case with integrative detailed documentation, the organization supplies ENAC all the information that will be discussed during a n interview with the candidate. Who has to probe to have the necessary knowledge, cultural basis and experience to take effectively the task.

If the organization suggests the persons who at the moment is Quality Manager of the organization for the task of Compliance Manager, ENAC will accept the candidate without further verification.

# 8. SAFETY PROMOTION

## 8.1 Training

It is important to the whole personnel to have the necessary competence for its function and the safety responsibility given to it. Only through a continuous training of the personnel it is possible to obtain this result.

The training should include organization SMS, safety policy, reporting procedures, safety responsibilities and accountabilities. The training should also include periodic updating courses.

The training program can consist in instruction given by media (newsletter, etc), training classes, e-learning or it can be supply by an external organization. The training has to be recorded in the organization documentation.

In accordance with the principles of a Just Culture, the whole personnel should be encourage to identify and report the hazards and to be careful to pay attention to the hazards connected with its tasks. Everything the organization has learned by the investigation should be effectively diffused to the personnel.

## 8.2 Safety communication

It is important for the personal that the personnel is fully conscious of the SMS and the operational safety questions. The safety information should be distributed also to the contracted organizations.

An effective communication ensures that the whole personnel is fully conscious of the SMS and the critical safety information about the analyzed hazards and assessed risks. All the staff should have clearly understand the reason of determinate actions and the introduction or modify of safety procedures.

Communication can be done through meetings, safety bulletins, newsletters, bulletins in showcases or send by e-mail or published on the organization web site. The organization can

periodically meet with the personnel to discuss information, procedures and actions about safety matters.

A way to promote safety in all aeronautic community is to contribute to a collective knowledge of safety questions. Therefore, organizations should support safety information sharing each others. For this purpose, organizations should establish communication channels with other organizations, business partners and authorities, record the information and made them easy to consult and take part to conferences and forum about aeronautic safety.

# 9. ENAC VALUATION AND ACCEPTANCE

Most of the organization have already some of the basic components of the SMS, so the first step for a correct development of a SMS is the identification of that elements which are already existent in the organization doing a gap analysis.

Then the management can develop a implementation plan for that components that are not present in a logic and structured way.

It is important to remind that a mature SMS requires time to be completely actuated. It is also important that all the personnel has the opportunity to give his contribute to the SMS development.

For the organization certification, according to the European regulations, the SMS have to be valuated and considered acceptable by ENAC. A SMS is acceptable when it complies the regulation requirements.

ENAC knows that SMS implementation needs times and several verifying interventions to test and improve the performance of SMS. Therefore the valuation can not be too severe and simply based on compliance comparison. So in a first time, the ENAC valuation focuses only on the key elements of a SMS and their definition, documentation and actuation.

Checks are based on compliance and performance indicators that aim to define a minimum acceptability and permit the certification deliverance.

# *PART II*

## *Safety management system manual*

# LOGO

# SAFETY MANAGEMENT SYSTEM MANUAL

## *(organization name)*

**Sede legale dell'Impresa:**

.....

**Sede operativa dell'Impresa:**

.....

Copia numero: 1 [ENAC _____]

Edizione 1 del _____

Revisione 0

## Part 0

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## Part 5



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## Part 7



## Part 8

## 0.1 Edition and revision list

| Date | Edition | Revision |
|---|---|---|
| | 0 | 0 |
| | | |
| | | |
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# 0.2 Effective pages list and approbation

| Part 0 | | | Part 1 | | | Part 2 | | | Part 3 | | |
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| Pag | Rev | Date | Pag | Rev | Date | Pag | Rev | Date | Pag | Rev | Date |
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| 2 | 0 | | 12 | 0 | | 15 | 0 | | 20 | 0 | |
| 3 | 0 | | 13 | 0 | | 16 | 0 | | | | |
| 4 | 0 | | | | | 17 | 0 | | | | |
| 5 | 0 | | | | | 18 | 0 | | | | |
| 6 | 0 | | | | | | | | | | |
| 7 | 0 | | | | | | | | | | |
| 8 | 0 | | | | | | | | | | |
| 9 | 0 | | | | | | | | | | |
| 10 | 0 | | | | | | | | | | |
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| 21 | 0 | | 26 | 0 | | 31 | 0 | | 46 | 0 | |
| 22 | 0 | | 27 | 0 | | 32 | 0 | | 47 | 0 | |
| 23 | 0 | | 28 | 0 | | 33 | 0 | | | | |
| 24 | 0 | | 29 | 0 | | 34 | 0 | | | | |
| 25 | 0 | | 30 | 0 | | 35 | 0 | | | | |
| | | | | | | 36 | 0 | | | | |
| | | | | | | 37 | 0 | | | | |
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| | | | | | | 44 | 0 | | | | |
| | | | | | | 45 | 0 | | | | |
| **Part 8** | | | **Part 9** | | | **Part 10** | | | **Part 11** | | |
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| 48 | 0 | | 56 | 0 | | 63 | 0 | | 65 | 0 | |
| 49 | 0 | | 57 | 0 | | 64 | 0 | | 66 | 0 | |
| 50 | 0 | | 58 | 0 | | | | | 67 | 0 | |
| 51 | 0 | | 59 | 0 | | | | | 68 | 0 | |
| 52 | 0 | | 60 | 0 | | | | | 69 | 0 | |
| 53 | 0 | | 61 | 0 | | | | | | | |
| 54 | 0 | | 62 | 0 | | | | | | | |
| 55 | 0 | | | | | | | | | | |

| Accountable Manager _____ | | | |
|---|---|---|---|
| Data: | Data: | Data: | Data: |
| | | | |

# 0.3 Reference documentation

- ICAO Safety Management Manual, third edition 2013;
- ICAO Annex 19 "Safety Management";
- Government of Bermuda "Conducting a Safety Management gap analysis";
- ENAC LG-2013/1 "Integrazione del Safety Management System nel sistema di gestione dell'organizzazione";
- EHEST safety management toolkit "Safety Management Manual";
- Civil Aviation Safety Authority of Australian Government practical guide "Safety risk management";
- Eurocopter information notice n° 2255-I-00 "Aid to introduction of a Safety Management System";
- "Implementing Safety Management System in Aviation" Stolzer, Halford, Goglia;

# 0.4 Definitions and acronyms

## Definitions

***Hazard***: A condition, object, activity or event with the potential of causing injuries to personnel, damage to equipment or structures, loss of material, or reduction of the ability to perform a prescribed function.

***Likelihood***: likelihood is used in this manual as a synonym of probability. It is a measure of how likely something is to happen.

***Safety risk***: the consequence of hazard measured in terms of likelihood and severity assessed into account the most unfavorable hypothesis.

***Safety Management System (SMS):***a systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures

***Severity***: seriousness of the outcome of an incident and an accident

***Undesirable Event (UE):***event leading to a stage in the escalation of an accident scenario (Undesirable Operational State) where the accident can be avoided only through successful recovery measure(s) or by chance.

## Acronyms

| | |
|---|---|
| ALARP | As low as reasonably possible |
| AM | Accountable Manager |
| BDCA | Bermuda Department of Civil Aviation |
| EASA | European Aviation Safety Agency |
| EC | European Commission |
| ENAC | Ente Nazionale Aviazione Civile |
| ICAO | International Civil Aviation Organization |
| MOE | Maintenance Organization Exposition |
| MOR | Mandatory Occurrence Reporting |
| SMM | Safety Management Manual |
| SMS | Safety Management System |
| UE | Undesirable Event |

# 0.5 Distribution

The copies of the Company manual are distributed as follows:

| Copy nr. | Receiver | Format |
|---|---|---|
| 1 | Aviation Authority | |
| 2 | Accountable Manager | |
| 3 | Safety Manager | |
| 4 | Quality Manager | |
| 5 | Maintenance Manager | |
| 6 | CAMO Post Holder | |
| 7 | Head of Part 145 Technical Department | |
| 8 | Head of Logistic Department | |
| 9 | Training Manager | |

The list of distributed copies is shown in the document "S.M.S.M. Distribution" filed care of the Quality System office.

# PART 1

# Scope of SMS

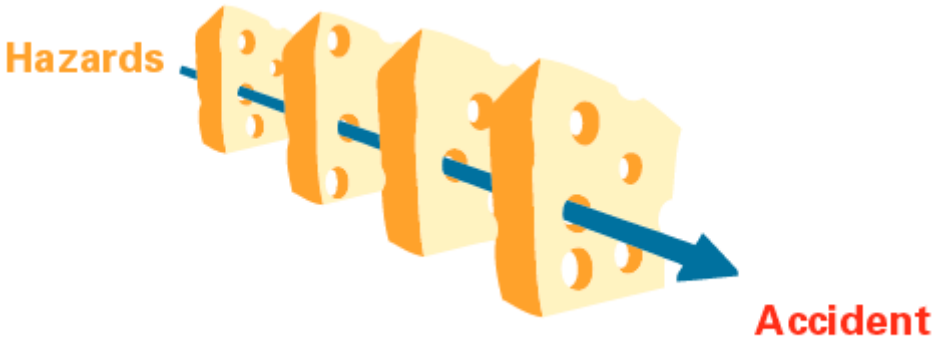
To explain accident causation is often used the 'Swiss cheese' model.

The model illustrates that an organization's defenses (slices of Swiss cheese) move around constantly, but if their holes align a hazard can pass through multiple layers of defenses (or slices of cheese).

According to the Swiss cheese model, some of the holes in defenses are due to errors (active failures) made by employees who are typically on the front line. Other holes in the defenses are caused by organizational factors (latent conditions), or other error-producing conditions in the workplace.

The Swiss cheese analogy suggests that no defenses are perfect. However, the critical task in maintaining safety is to find the holes in the defenses, and build stronger and better layers of defense.

***Figure 1.1 Swiss cheese analogy***




The Safety Management System of the Company ensures:

- A high level of awareness of the employees with regard to safety;
- A systematic recording and analysis of any kind of feedback, including occurrences and latent condition;
- Pro-active gathering of safety relevant data;
- Re-active, pro-active and predictive analysis of hazard and assessment of their risks;
- Eradication, mitigation and maintenance of risks to or below acceptable levels;
- Monitors to the compliance, implementation, effectiveness and efficiency of company specific and safety related policies, standards or procedures ;
- Systematic implementation and monitoring of mitigation actions.

# 1.1Gap analysis

Before beginning the SMS implementation it is useful to do a gap analysis, that is fill in a checklist to find the differences between the current status of the safety measures already adopted by the company and the ones requested by a SMS. The scope is to have a gap recognition.

To conduct a effective gap analysis, two benchmarks must be established: the first benchmark is represented by the question "What is?" and the second is the question "What should be?" that is define by the line guides given by the authority.

We can have three types of gaps:

- Perceptual gap: is a difference between the internal and external perceptions of the safety status of the organization and the optimal, that is the desired state;
- Design gap: we have it as a consequence of not correct actions made to fill the gap between the actual status and the optimal;
- Organizational/management gap: is a deficiency that exists within the planning, organizing, directing and controlling function of management that affect the safety status of the organization. This gap originates one or more management functions which inhibit or block the achievement of optimal performance;
- Performance gap: is a difference between the actual status and the optimal. It can be a negative (when the status does not meet the standards) or positive (when there are higher standards than the requested ones).

The desired state is a zero gap. When there is a gap, its causes are to be determinate and the gap filled.

The information collected by the checklist give to the management an idea of the effort and the recourses needed to implement the SMS.

In case of negative or partial answer, the Company have to organize an action plan, assess the responsibility and accountability and establish the times for the implementation.

The gap analysis checklist and answers are the content of annex I of this manual.

# PART 2

# Safety policy and objectives

# 2.1 Safety policy

Safety is one of our core business functions.

We are committed in developing, implementing, maintaining and constantly improving strategies and processes to ensure that all our training and aviation activities take place under balanced allocation of resources, aimed at achieving the highest level of safety performance as well as meeting national and international standards.

All levels of management are accountable for delivery of this highest level of safety performance, starting from the Accountable Manager .

Our commitment is to:

- Support the management of safety through the provision of appropriate human and financial resources that will result in an organizational culture that fosters safe and secure practices, encourages effective safety reporting and communication, and actively manages safety with the same level of attention to results as financial management requires;
- Enforce the management of safety and security among the primary responsibility of all managers;
- Clearly define, to all staff, their accountabilities and responsibilities in the delivering safety performance;
- Establish and implement hazard identification and risk management processes in order to eliminate or mitigate the risks associated with (aircraft / maintenance / training) operation to a point which is As Low As Reasonable Possible (ALARP);
- Comply whit and wherever possible exceed legislative and regulatory requirements and standards;
- Ensure sufficient skilled and trained resources are available to implement safety strategies and processes;
- Ensure that all staff are provided with adequate and appropriated aviation safety information and training, are competent in safety matters and are only allocated tasks commensurate with their skills;
- Establish and measure our safety performance against realistic objectives and/or targets;
- Continually improve our safety performance and conduct safety management reviews to ensure relevant safety action is taken and is effective;
- Ensure externally supplies system and services to support our operations are delivered meeting our safety performance standards.

it is our primary concern to ensure that there is full, free and inhibited reporting of all incidents that could affect aircraft safety.

It is therefore the responsibility of every employee to report any such circumstances and co-operate fully throughout any subsequent investigation.

Incident investigation are conducted for the purpose of establishing both the pacts and the cause of the incident, so that further occurrence con be prevented. They are not conducted to apportion either blame or liability.

Where an employee has fully complied with his responsibilities to report the circumstances and to co-operate fully throughout any investigation, and where the employees has not behaved recklessly, the Company will not take any disciplinary action.

However, if an employee fails to report an incident affecting aircraft operational safety, which he/she has either caused or discovered, or he/she has behaved in a reckless manner, then the disciplinary process will be initiated.

It is the policy of the Company that the substance of any conclusion following the investigation of incidents should be disseminated where possible and appropriate in the interests of aircraft operational safety.

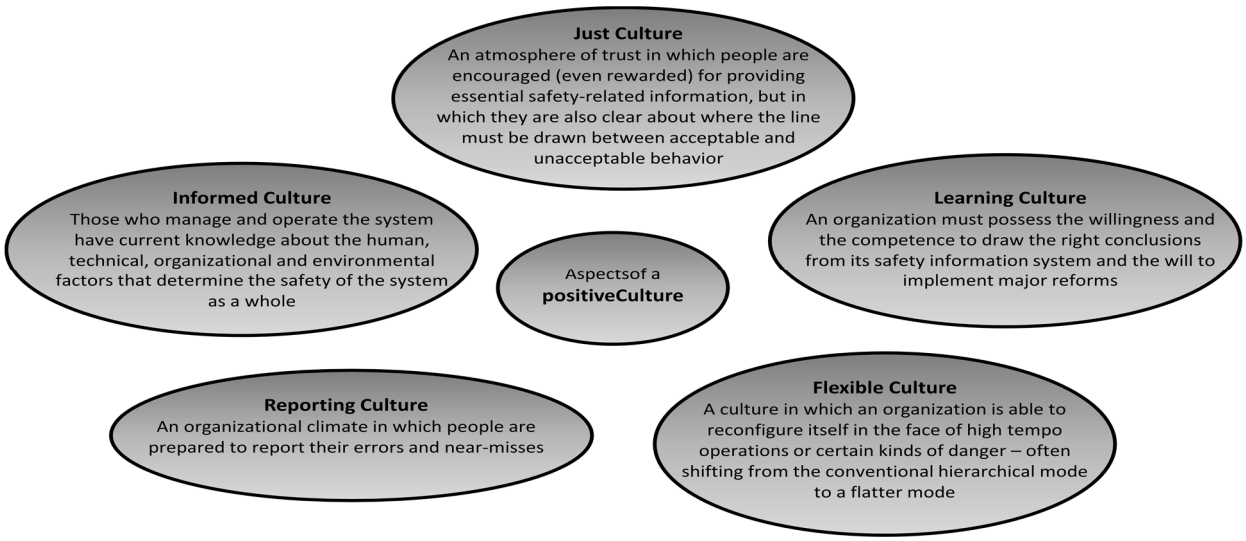
In addition, the Company will take all the necessary steps not to disclose the identity of the reporter, or of those individuals involved n an occurrence to any third part, except when required to do so by law or with the consent of those persons concerned.

Where individuals are involved in incidents involving aircraft safety, the Company, at its sole discretion, may relieve those individuals from their current duties until the incident is resolved and/or Company action or remedial has been taken.

The policy ensures the following five aspects of a positive culture:

- Just culture
- Learning culture
- Flexible culture
- Reporting culture
- Informed culture

***Figure 2.1 Aspects of a positive culture***




**The Accountable Manager** **Date: .....**

**Mr. .....**

# 2.2 Objectives

Every year in January, the Accountable Manager fixes annual Company goals and the budget based on the safety policy and the yearly adjusted strategy in accordance with the management evaluation.

Any kind of Company specific standard of safety performance must respect the safety policy statements.

The objectives are established by performance indicators. The indicator are listed in the following table.

***Table 2.1 Safety prformance indicators***

| N° | Safety performance Indicator | Value |
|---|---|---|
| 1 | Number of incidents | |
| 2 | Number of major inconvenient | |
| 3 | Number of internal audits | |
| 4 | Number of hazard/safety reports | |
| 5 | Number of complains for parts in guarantee period | |
| 6 | Number of mandatory bulletins not adopted | |
| 7 | Number of assembling errors | |
| 8 | Number of work documents not updated | |
| 9 | Number of uses of expired instrumentation | |
| 10 | Hours for recurrent training of personnel | |

# PART 3

# Safety accountability of the accountable manager

In addition of the duties and responsibilities described in the relevant manuals of the Company, in regards to the safety management the Accountable Manager has the following duties and responsibilities:

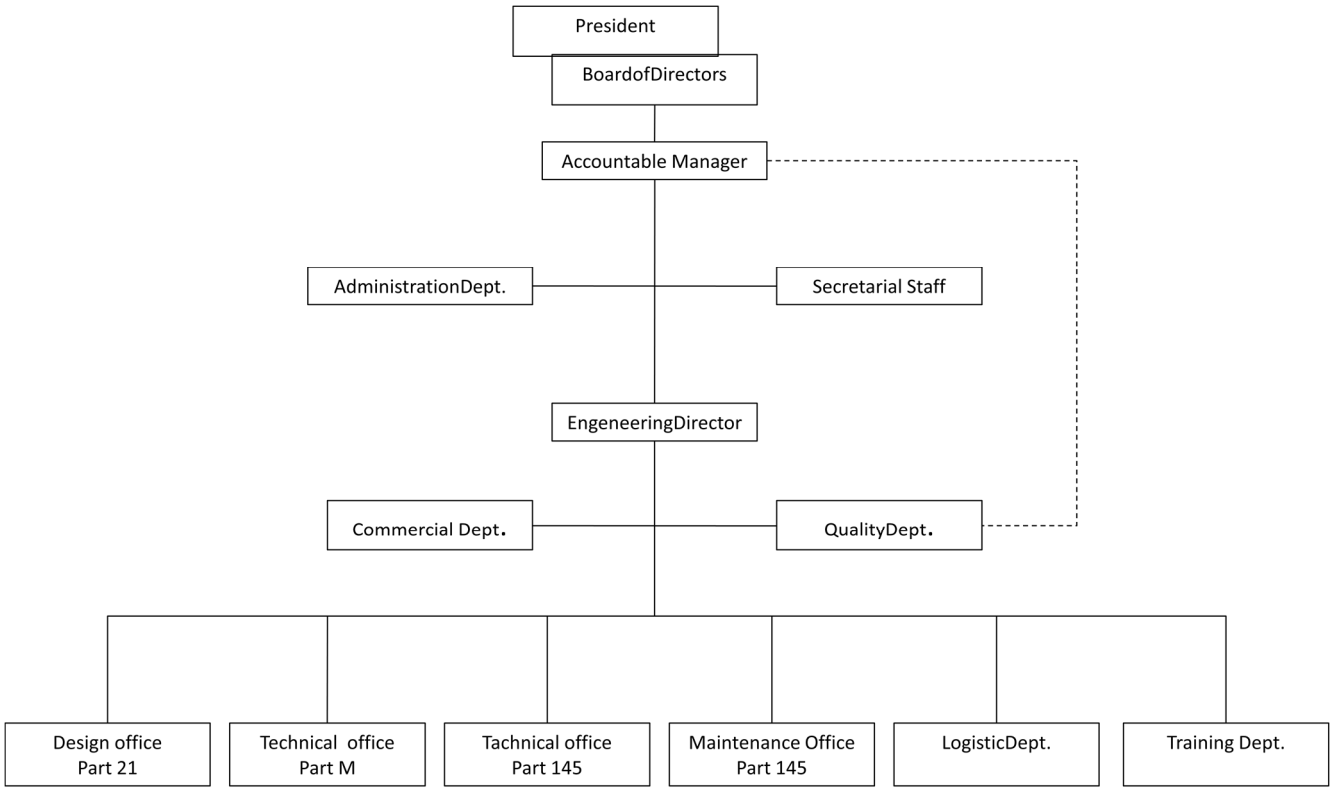
- To own the corporate authority for ensuring that all activities can be financed and carried out to the standard required by the Authority;
- To establish and to maintain the safety policy statement
- To promote the corporate culture of safety and quality;
- To define the Company safety objectives;
- To own the overall responsibilities for the SMS including the frequency, format and structure of the internal management evaluation activities;
- To approve any amendment to this SMM before it is issued;
- In the event of a loss of capability of any Company sector, to act to ensure the restoration of the initially approved operational technical requirements as soon as possible;
- To ensure timely notification of ENAC of any changes that may occur in the manner indicated in the section “Procedure for the notification of the competent authority of changes in the activities and personnel of the organization” set out in Part 11 of this manual;
- To satisfy the requests from Company sectors regarding personnel training, supply of equipment and any other item necessary to enable the performance of activities covered by the certification;
- To take responsibility for the implementation of corrective measures.

# PART 4

# Responsibility of key safety personnel

# 4.1 Management Organization chart

***Figure 4.1Management Organizational Chart***




**Accountable Manager** .....
**Technical Director** .....
**Safety Manager** .....
**Quality Manager** .....
**Maintenance Manager** .....
**Head of Part 145 Technical Office** .....
**CAMO Post Holder** .....
**Training Manager** .....
**Head of Logistic Department** .....

**Signature:**.....

(**Accountable Manager**) **Date:**.....

## 4.2 Safety Manager

The Safety Manager is the responsible and focal point for the development, administration and maintenance of the effective SMS:

- He has direct access to the Accountable Manager and relevant managing staff;
- He facilitates hazard identification and safety risk analysis and management;
- He monitors the implementation of actions taken to mitigate risks, as listed in the safety action plan;
- He provides periodic data evaluation reports on safety performance as an input to the management evaluation;
- He maintains record of safety management documentation;
- He plans and organizes staff safety training;
- He advices all Post Holders managers on safety maters,
- He ensures initiation and follow up of internal occurrence/accident investigation and provides feedback and recommendations;
- He oversees hazard identification systems;
- He is authorized to conduct safety audits of any aspect of the operation;
- He supports the Accountable Manager in the promotion of the safety culture;
- He monitors safety concerns in the aviation industry and their perceived impact in the operations of the organization aimed at service delivery;
- He reports the MOR to the concerned Authorities;
- He coordinates and communicates on safety issues within the organization, as well as with the National Aviation Authority, external agencies, contractors and stakeholders as appropriate.

## 4.3 Safety Review Board

The Safety Review Board is a high level committee that consider strategic safety functions.

It is chaired by the Accountable Manager and be composed of the Safety Manager, Quality Manager, and all nominated Company Post Holders.

The Safety Review Board should monitor:

- Safety performance against the safety policy and objectives;
- The effectiveness of the SMS implementation plan;
- The effectiveness of the safety supervision of contracted operations.

It ensures the appropriate resources are allocated to achieve the established safety performance and gives strategic direction to the safety action group.

Safety Manager is responsible to organize a Safety Review Board every six months.

# 4.4Safety Action Group

The Safety Action Group is composed by the Safety Manager, the Quality manager and the Post Holder/s relevant for the subject discussed by the Safety Action Group.

The Safety Action Group must:

- Oversee operational safety;
- Resolve identified risks;
- Assess the impact on safety of operational changes;
- Implement corrective actions
- Ensure that corrective actions is achieved within agreed timescale.

The Safety Action Group must review the effectiveness of previous safety recommendations and safety promotion.

Safety Manager is responsible to organize a Safety Action Group when necessary.

# 4.5 Risk assessment team

The risk assessment team is composed by quality personnel department, who must have experience in safety matters, the Maintenance Manager and the Safety Manager, who can invite members of the personnel, who typically do the activity discussed.

The risk assessment team have to:

- Identify hazards;
- Estimate severity and consequences;
- Estimate likelihood;
- Decide upon acceptance of the risk;
- Mitigate risk taking action to reduce the risk to an acceptable level (ALARP) and defining an action plan;
- Re-evaluate risk after the implementation of mitigations;
- Edit documentation to ensure a permanent record of the final result of the safety assessment, of the arguments and evidence demonstrating that the risk have been eliminated, or have been adequately controlled and reduced to a tolerable level.

The Safety Manager have to organize the meetings for the risk assessment every six months.

# 4.6 Employees

Each employee is responsible and personally accountable for:

- Performing only those technical function for which he/she is trained;
- Following/supporting established safety policy, practices, procedures and operational requirements;
- Notifying management of unsafe condition directly or through anonymous procedures;
- Operating only that equipment on which he/she has been trained and is qualified to operate;
- Keeping work areas free of recognized hazards.

# PART 5

# Documentation control procedure

## 5.1 Company field of operation and related approvals

The Company operates in the following fields:

- Maintenance, owning EASA Part 145 Approval number IT.145.036, and Bermuda DCA Approval number BDCA/AMO/210;
- Continuing Airworthiness Management, owning EASA Part 145 Approval number IT.145.036, and Bermuda DCA Approval number BDCA/AMO/210;
- Theoretical and practical training of maintenance technicians;
- Supply of spare parts, components and equipments.

## 5.2 Relevant external standards

The Company has to comply with the following legal requirements:

- Commission Regulation (EC) 216/2008 of 20 February 2008 and all amendments
- Commission Regulation (EC) 2042/2003 of 20 November 2003 and all amendments
- ICAO Safety Management Manual Doc. 9859
- Italian Law
- Aviation Authority rules and regulation

## 5.3 SMS documentation

The Company set up the manual listed below. The application and implementation of those document contribute to ensure safe operation and airworthy aircrafts.

- "ISO 9001 Quality Assurance Manual" reporting the quality policy adopted by the Company;
- M.O.E. Manual: "Maintenance Organization Exposition" reporting the procedures of the Maintenance Department of the Company;
- M.O.E. BDCA Manual: "Maintenance Organization Exposition- additional procedures for BDCA" reporting the additional procedures for the A.M.O. Department of the Company for the Authority Bermuda DCA;
- M.T.O.E. M annual: "Maintenance Training Organization Exposition" reporting the procedures of the Training Department of the Company;
- C.A.M.E. Manual: "Continuing Airworthiness Management Exposition" reporting the procedures of the C.A.M.O. Department of the Company;
- C.A.M.E.- BDCA Manual: "Continuing Airworthiness Management Exposition – additional procedures for BDCA" reporting the additional procedure of the C.A.M.O. Department of the Company for the Authority Bermuda DCA;

- Q.O.E. Manual: "Quality Organization Exposition" reporting the procedures of the Quality Department of the Company;
- D.O.E. Manual: "Design Organization Exposition" quoting the procedures of the Company for managing the Design Service;
- C.O.E Manual: "Commercial Organization Exposition" reporting the procedures of the Commercial Department of the Company;
- L.O.E. Manual: "Logistics Organization Exposition" reporting the procedures of the Logistics Department of the Company;
- "Manpower Resources Exposition" reporting, by year, the maintenance activity planned and reviewed by the Company;
- "Company Personnel Manual" reporting the Company's certifying staff and all of the human resources of the Company Employed in different activities;
- "Company Bases Manual" reporting the description of facilities on the Company's maintenance bases.
- "Capability List" Manual listing the typologies of maintenance activities on turbine engines, equipments and components, avionic installations, various different installations, for which the Company is qualified.

The SMS documentation includes:

- The safety policy and objectives;
- The accountabilities of the Accountable Manager and key staff members;
- The results of safety-related processes, procedures or checklist, of safety audits, of risk assessment and mitigation measures;
- The hazard log.

# 5.4 Documentation control procedure

## 5.4.1 Control and revision of the Manual

The Accountable Manager is responsible for the content of this Safety Management System Manual and for compliance with its procedures.

Responsibility for issuing this manual and for its subsequent revision, as well as obtaining the Authority approval when needed, is charged to the Safety Manager, who avails himself of the collaboration of all the Post Holders of the Company for the activities within the scope of their responsibilities.

The Safety Manager shall ensure that the documents and procedures are updated properly.

The manual and its revision can be distributed in paper or electronic format, according to the end user preference.

The content of each revision must first be approved by the Accountable Manager before distribution.

All revisions issued shall be distributed as quickly as possible to the recipients of the copies in distribution. Each revision shall be accompanied by the list of the effective pages, emphasizing the revised pages, for which the revision date and number are shown.

Proof of the receipt of the revision by the recipient of the copy of the SMS manual shall be:

- By signature of acceptance on the revision distribution form, in case of personal hand delivery of the revision;
- By return of the letter, signed for receipt, accompanying the revision sent by mail;
- By return of an e-mail stating the receipt of the revision in case of electronic format.

In the event of revision of one or more pages of the SMS manual, the complete procedure is re-issued and it replaces the obsolete one.

The modified text and/or any addition shall be emphasized using italic underlined characters (***EXAMPLE example***) and enclosed in square brackets []. In the subsequent revision of the same page, the modified text of the proceeding revision is re-written using the standard characters and the square brackets removed.

The eliminated text is replaced with a space enclosed in square brackets [ ]. In the subsequent revision of the same page the square brackets are eliminated.

The list of revision incorporated, with the number of revision, the date of issue, approval by the Accountable Manager, is shown on page carrying the list of incorporated revisions.

Each copy of the SMS manual is valid only if it incorporates all revisions.

In case of differences between the manual used by the Safety Manager and the manual distributed to the personnel of the Company, then the manual used by the Safety Manager is considered the authentic one.

## 5.4.2Record keeping

All records shall be kept in a secure place by the Safety Manager and be accessible whenever needed within a reasonable time.

The records shall include the following documents:

- Safety objectives and indicators;
- Safety Review Board reports;
- Safety Action Group reports;
- Safety reports (permanent);
- Audit Reports;

- Hazard log (permanent);
- Safety training register (permanent);

Paper systems should be on a robust material which can withstand normal handling and filing. Computer based systems should have at least one backup system which should be updated within 24 hours of any new entry. Computer based systems should also include appropriated safeguards against the possibility of access by un authorized personnel to prevent tampering with the data.

All computer hardware used for data backup must be located in a different location from that containing the original working data and in an environment that ensures they remain in good condition. When hardware or software changes take place , special care is to be taken to ensure that all necessary data continues to be accessible throughout at least the full period specified in the relevant implementing rules.

In absence of such indication, all records should be kept for a minimum period of 5 years.

# PART 6

# Hazard identification and risk management schemes

# 6.1 What is an Hazard?

ICAO defines a hazard as a condition/situation or an object with the potential to cause injures to personnel, damage to equipment or structure, loss of material, or reduction of ability to perform a prescribed function.

ICAO groups hazards in three families:

- Natural: hazard that are consequence of the environment where the operation take place;
- Technical: are the result of malfunction of equipment, software, or sources of energy;
- Economic: are the consequence of the sociopolitical-economic world in which the Company works.

# 6.2 Hazard identification process

Before application of EU Reg. 1178/2011 and 290/2012 quality system according to Part 145 M have been a proactive and reactive quality assurance activities. Those system must be further developer to be more pro-active and even predictive.

Effective Safety management bases on three approaches:

- Reactive Safety Management
- Pro-active Safety Management
- Predictive Safety Management

The reactive approach consists of analyzing accidents and incidents that have occurred and trying to understand why. It is based upon the notion of waiting until something breaks. Based on the analysis of reported accidents and incidents, the following question have to be asked: “what did happen and why?”. An example of this approach is the analysis of the occurrence reports.

The proactive approach consists of analyzing the conduct of operations to identify potential hazards and asses the associated risks and then to mitigate risks factors before they result in an accident or incident. This approach should trigger the following questions: “Who and why?”.it is based on mandatory and voluntary reporting systems, safety audits and surveys and upon the notion that failures can be minimized by identifying safety risk within a system before it fails and that necessary actions can be taken to reduce such risks. In this phase of identification there is the risk-analysis of already implemented procedures before incident occur.

The predictive approach consists of anticipating and addressing future possible hazards thereby addressing today the risks of tomorrow. So we have to look for trouble and not to wait for it and answer the following question: “what could happen in the future and why?”. In this phase there is the risk-analysis of new procedure before implementation.

The following paragraphs explain the "5 why's" method for hazard identification and risk assessment.

## 6.3 Hazard identification sources

Hazards can be identified from different internal and external sources by asking the following question: "what elements in my activity, in isolation or combination, may have contributed or could contribute to an incident or an accident? What are the hazards?".

External sources can be:

- Exchange of information with other companies;
- Incident/accident of data bank;
- Reports of national and international organizations (for example the ICAO database);
- Analysis of manufactured recommendation;
- Accident reports of air accidents investigation board.

Internal sources can be:

- Incident report analysis;
- Voluntary reports;
- Reports of safety audits;
- Follow-up of safety indicators;
- Statements of employees;
- Brainstorming;

The members of the risk assessment team have to do researches and check the sources and present the result during meetings done for the hazard identification and risk assessment.

It could be also beneficial to include the employees who typically do the work the team is discussing about. Including them will provide important insight into how they do their task and would be possible understand the potential problems. It can also create a greater sense of involvement.

To have the collaboration of the employees with voluntary reports it is important not to destroy the safety reporting culture. So, to have a valuable source of safety data the Company have to avoid to do this three things:

- Punitive action: the employees must feel safe to report mistakes and errors, without compromising their employment.
- No action: if the management does not take any action on an important safety issue, employees will lose faith in the safety report system.
- No feedback: it is important to thank the employees for reporting a safety concern and communicate the response.

Hazards can, in isolation or combination, lead to undesirable safety events, a intermediate step between hazard and risk, and incident and accidents.

For every hazard the team have to say to which type of activity or operation it is referred and if it is a natural, technical or economical hazard.

When the hazard have been found the risk assessment team have to find the undesirable events. For each hazard the team should ask the following question: "what were or could have been the possible hazard consequences?".

To do this study is suggested the method of brainstorming during meetings composed by one person who represent every activity of the Company.

## 6.4 Risk assessment

To every safety event is associated a risk.

The risk assessment team should ask the question: "who might be harmed and how? What can be broken and how?".

This question have to be asked for every undesirable event a hazard could cause.

When the risks are found, each of them have to be assessed separately. To do the assessment the team need to analyze likelihood and severity, because risks are defined as a combination of the likelihood of occurrence and the associated severity:

RISK = SEVERITY x LIKELIOOD

The value of likelihood and severity have to be defined using the tables 6.1 and 6.2.

***Table 6.1 Likelihood classification***

| VALUE | RISK LIKELIHOOD | MEANING |
|---|---|---|
| 5 | FREQUENT | Likely to occur many times. Has already occurred in the Company. Has occurred frequently in the history of aviation industry.<br><br>Imminent, is expected to occur in most circumstances. |
| 4 | OCCASIONAL | Likely to occur sometimes. Has already occurred in the Company. Has occurred in frequently in the history of the aviation industry.<br><br>Once in the next month, will probably occur in most circumstances. |
| 3 | REMOTE | Unlikely to occur, butt possible. Has already occurred in the Company at least once. Has seldom occurred in the history of the aviation industry.<br><br>Once in the next 12 months, might occur at some time |
| 2 | IMPROBABLE | Very unlikely to occur. Not know to have occurred in the Company but has already occurred at least once in the history of the aviation industry.<br><br>Once in the next 1-5 years, could occur at some times. |
| 1 | EXTREMELY IMPROBABLE | Almost inconceivable that the event will occur. It has never occurred in the history of the aviation industry.<br><br>Once in the next 10 years, may occur only in exceptional circumstances. |

***Table 6.2 Severity classification***

| VALUE | SEVERITY OF OCCURRENCE | MEANING | | | |
|---|---|---|---|---|---|
| | | Personnel | Environment | Material values and assets | Reputation |
| E | CATASTROPHIC | Multiple fatalities | Massive effects (pollution, destruction, etc.) | Catastrophic financial loss | International impact |
| D | HAZARDOUS | Fatality | Effect difficult to repair | Severe financial loss with long term effects | National impact |
| C | MAJOR | Serious injuries | Noteworthy local effects | Substantial financial loss | Considerable impact |
| B | MINOR | Light injuries | Little impact | Financial loss with little impact | Limited impact |
| A | NEGLIGIBLE | Superficial or no injuries | Negligible or no effects | Financial loss with negligible impact | Light or no impact |

The team have to use the results of likelihood and severity analysis as input data for the risk matrix and understand in which zone (red, yellow or green) is the analyzed risk.

***Table 6.3 Risk matrix***

| | | Severity | | | | |
|---|---|---|---|---|---|---|
| | | Catastrophic | Hazardous | Major | Minor | Negligible |
| Likelihood | Frequent | 5E | 5D | 5C | 5B | 5A |
| | Occasional | 4E | 4D | 4C | 4B | 4A |
| | Remote | 3E | 3D | 3C | 3B | 3A |
| | Improbable | 2E | 2D | 2C | 2B | 2A |
| | Extremely improbable | 1E | 1D | 1C | 1B | 1A |

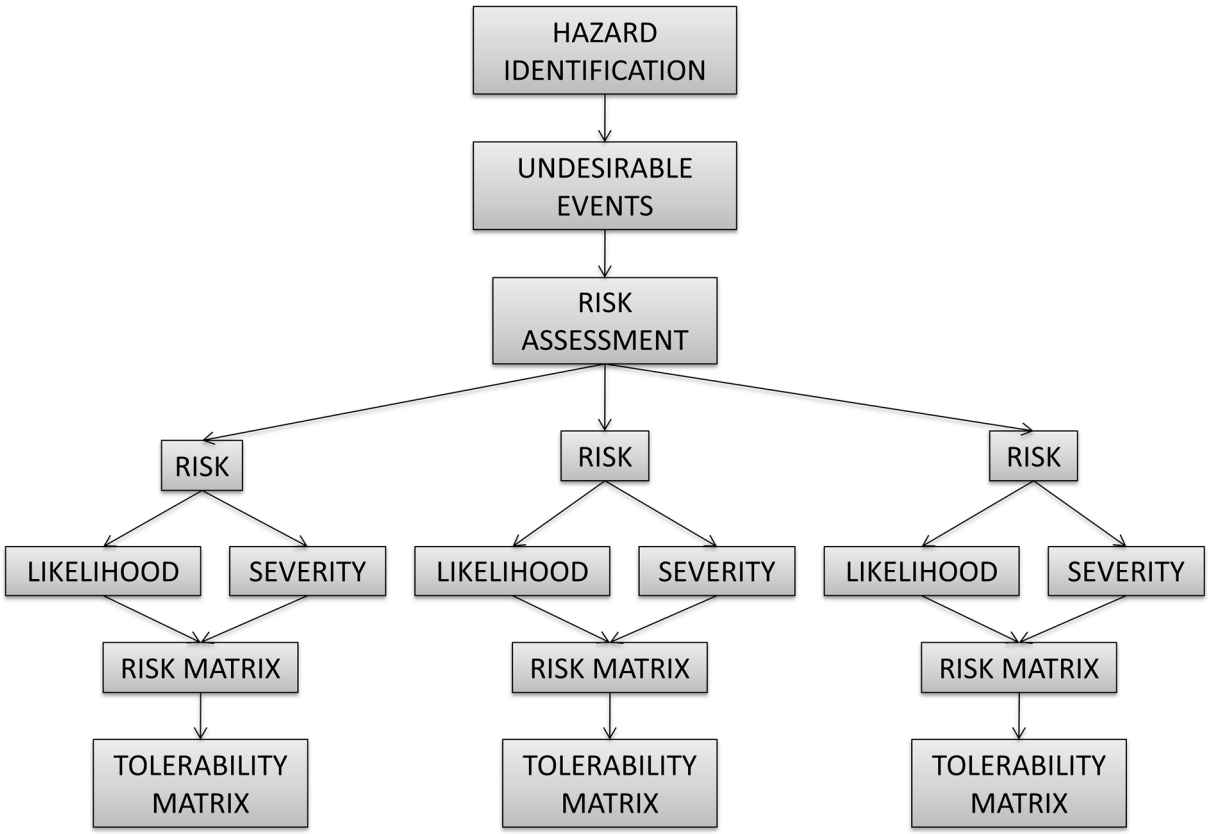
Now is to understand if the Company would accept the risk or not. The tolerability matrix gives this information. For every zone (red, yellow or green) of the risk matrix the tolerability matrix says if the risk is acceptable, tolerable or unacceptable.

***Table 6.4 Tolerability matrix***

| | | |
|---|---|---|
| Intolerable region | 5A, 5B, 5C, 4A, 4B, 3A | Unacceptable under the existing circumstances: the likelihood and/or the severity of the consequences of the event are intolerable. Action required: prohibit/suspend the operation. Operation may be resumed only when risk level is returned to tolerable or acceptable. |
| Tolerable region | 5D, 5E, 4C, 4D, 4E, 3A, 3B, 3D, 2A, 2B, 2C | Acceptable based on risk mitigation. Mitigation measures have to be taken to reduce the risk to a as low as reasonable possible (ALARP) level. The acceptability of the residual risk may require management decision |
| Acceptable region | 3E, 2D, 2E, 1A, 1B, 1C, 1D, 1E | Acceptable: the consequence is so improbable or not enough severe not to be alarming; the risk is acceptable. However a further risk mitigation is suggested to minimize the risk of an incident or an accident |

The next scheme illustrates the just explained process.

***Figure 6.1 Risk asssessment scheme***



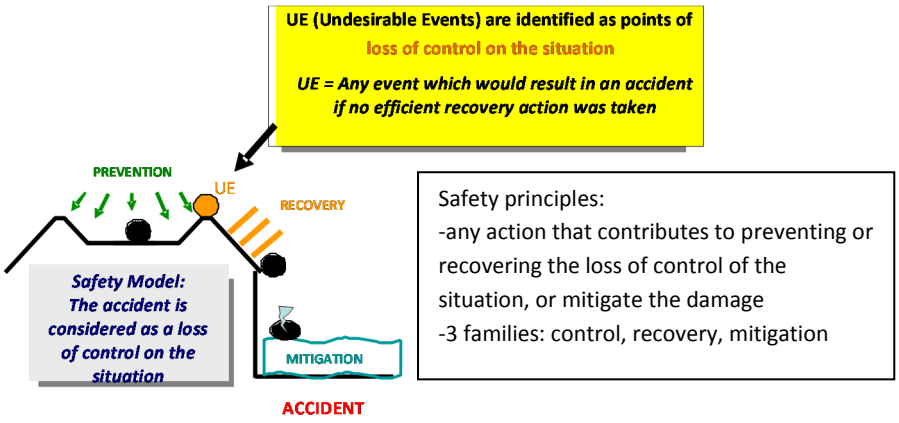

After the risk assessment, the team have to indicate which are the existent barrier or mitigation against the possibility of the consequences of a risk could happen. The following question have to be asked: "What are you already doing?".

Then there is the need to repeat the likelihood and severity analysis and see the result of the risk and tolerability matrixes and ask: "Do you need to do anything else to control the risk?". if there is the need to do anything else, the teem have to repeat an other time the analysis of the risk.

The Company employs the "As Low As Reasonably Practicable" risk acceptance criterion. That means that the safety risk is being managed to as low a level as reasonably practicable whilst at all times staying below the maximum allowed risk.

To find barriers and mitigation can be useful to consider the undesirable event like a ball which roll in a bowl as showed in the following figure.

***Figure 6.2 Bowl safety model***




The purpose is to prevent the ball from reaching the edge of the bowl and falling, i.e. to remain in the zone of control. If the ball reaches the edge of the bowl, an undesirable event occurs, the zone of control have been left. So is needed to return in the zone of control or, failing this, to prevent the ball from falling. The mitigation "mattress" symbolizes all the protective measures which may be implemented to limit/mitigate the consequences of an accident.

Finally there is a last question to ask: "Action by who and when?". This question is to indicate who is responsible for the mitigations and when they will be implemented.

The whole process can be summarize in a table for every hazard. A sample of the table is showed in table 6.5.

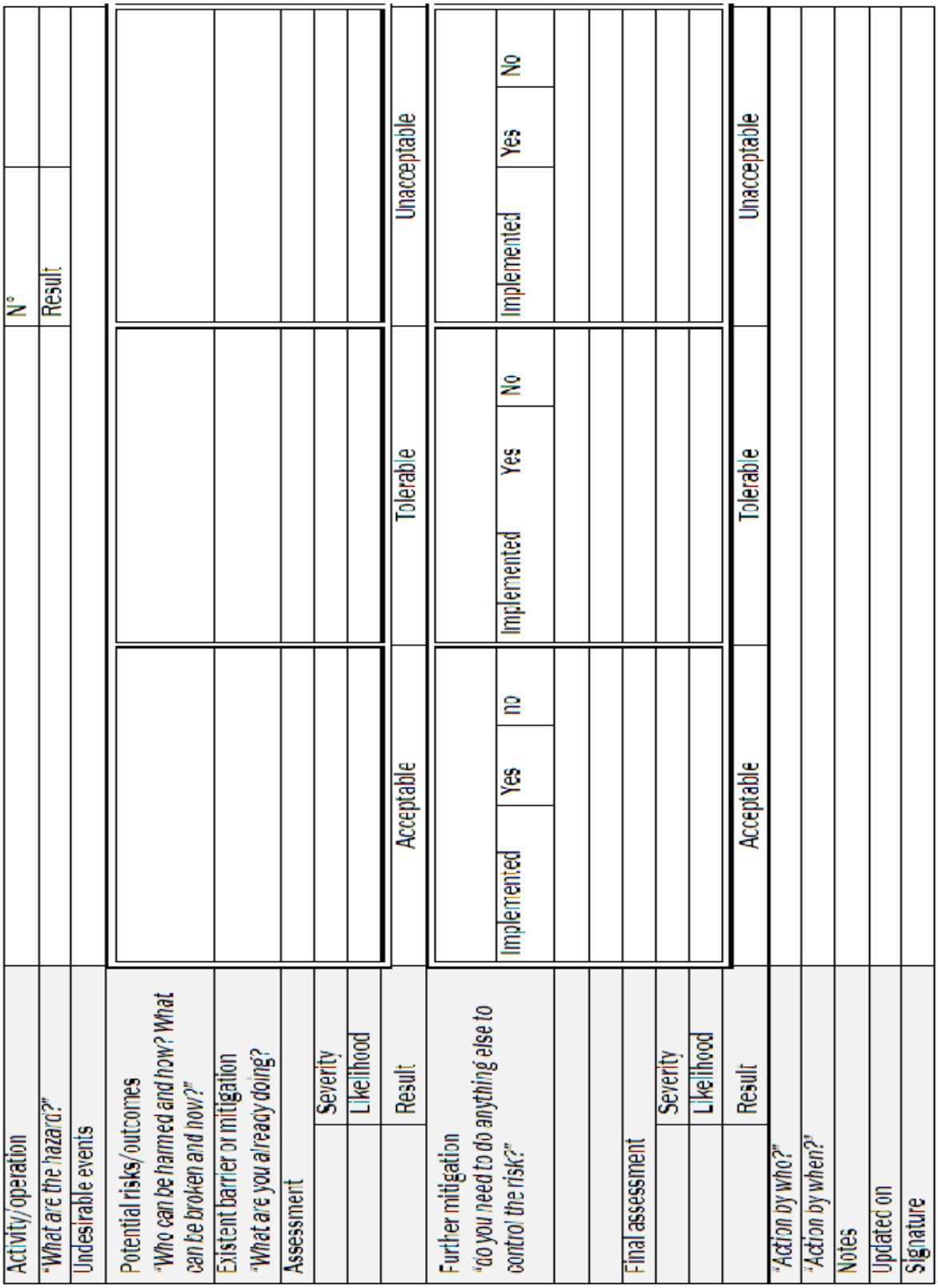
A hazard can have more than a potential risk as consequence. So the risks are divided in columns with a double edge. The doubled edge help to understand to which risk refers the information, like the severity or likelihood. Every outcome is identified by a code in bold letters, for example "**01**"

So there will be more than one result (acceptable, tolerable or unacceptable). In the table the team have to cross the box with the result of the worst condition analyzed.

There is a row (notes) in which the team can write some annotation it consider have been relevant during the analysis.

In the upper right corner there is a cell where to indicate the result of the assessment in terms of likelihood and severity and the inside has to be colored with the correspondent color taken from the tolerability matrix (red for unacceptable, yellow for acceptable or green for acceptable), for example 3B colored with yellow, that means remote and minor, and is a tolerable result.

***Table 6.5 Risk assessment form***



# 6.5 Hazard log

Any identified hazard, risk assessment and subsequent follow-up actions need to be clearly documented.

To do this a hazard log has to be created. The log should include each identified hazard, the associated risk(s), result of the risk assessment taking into account any current mitigation measures in place, further risk mitigation if required and a re-assessment of the risk once the mitigation measures have been implemented, to assess whether they have archived the desired outcome. In the firs page of the log there should be a recapitulatory table that list the hazards and the final result of assessment in term of severity and likelihood (for example: 1A).

The hazard log is a working document and should review regularly, especially during any Risk Assessment Team meetings.

The hazard log is the content of annex II of this manual.

# 6.6 Outcomes analysis

After the conclusion of the risk assessment procedure, the risk assessment team have to take the hazard log and analyze all the outcomes resulted to find reactive controls to mitigate the consequence of a risk.

To carry out the analysis, the team have to follow a logical scheme similar to the risk assessment one of the 5W, using the form shown in the table 6.6 .

For every outcomes the team have to list all the hazards which could cause it answering the question “What are the hazards who caused it?” and give an assessment of severity and likelihood using the same criteria used during the risk assessment. Every hazard has to be identified by a code in bold letters, for example “**H1**”

Then the team have to ask itself “What are you already doing to react to this outcome?. In this way, it can understand how the Company is managing the consequence of a risk and how it manage to respond when barriers and mitigation did not work. Every reactive controls is assessed separately in column with a doubled edge. The result to indicate is the worse scenario one.

If there is the need or the team have further ideas to control the outcome can suggest it, this means ask the following question: “Do you need to do anything else to control the outcome?”

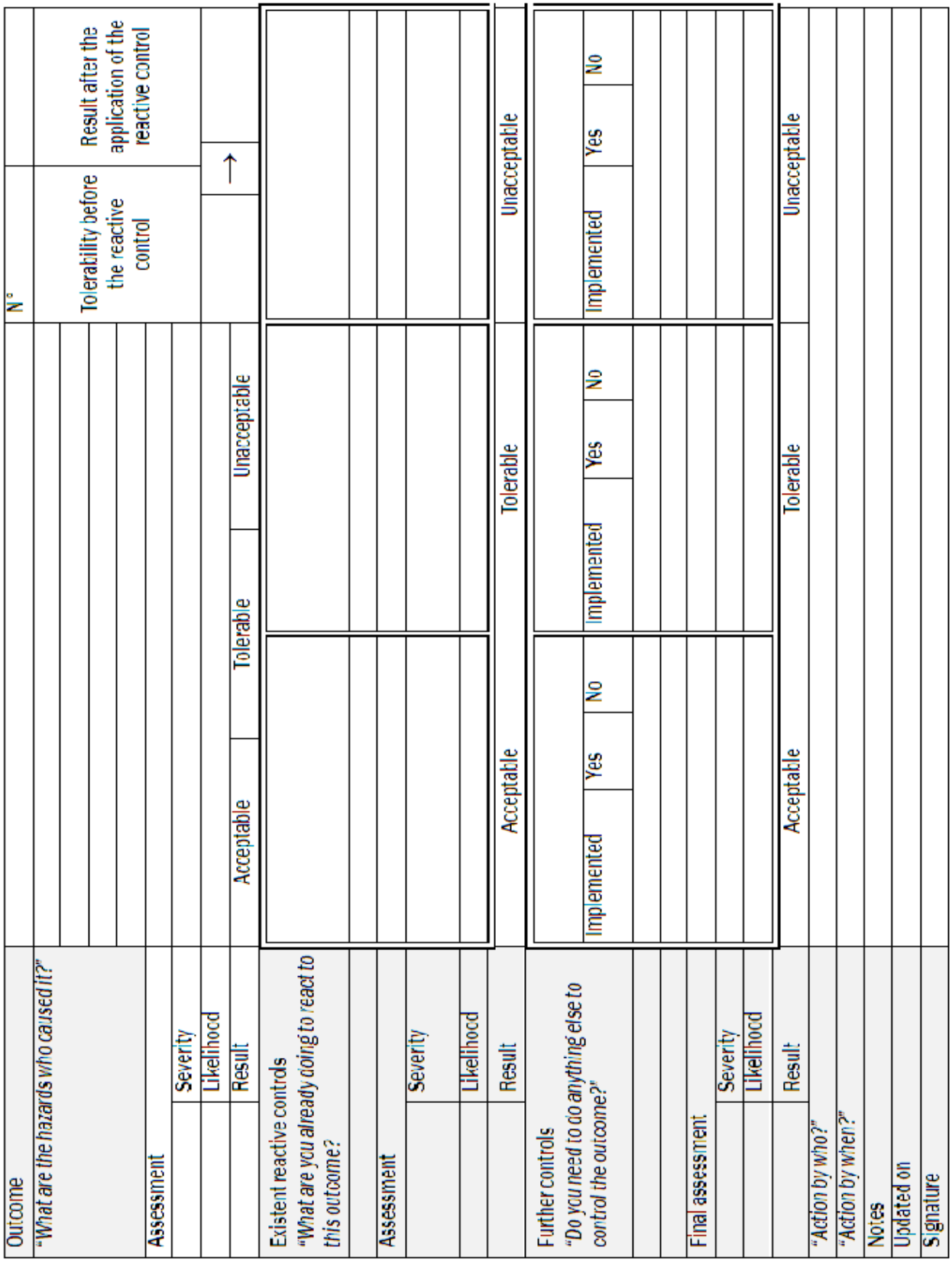
At the end the team have to indicate who is responsible for the reactive controls and when these have to be implemented (if they are nor already), answering the two last questions “Action by who?” and “Action by when?”.

In the upper right corner there is some cells that permit to summarize the analysis, reporting the assessment before (left column) and after (right column) the application of the reactive controls. In terms of code of likelihood, severity and color, like explained for the result cell of the risk assessment form.

All the forms of outcomes analysis are collected in annex III of this manual in a outcome log.

As in the hazard log there is a firs page containing a table that list the outcomes and the final result of assessment in term of severity and likelihood (for example: **1B→1A**).

***Table 6.6Outcomes analysis form***



# 6.7 About risk assessment and outcomes analysis

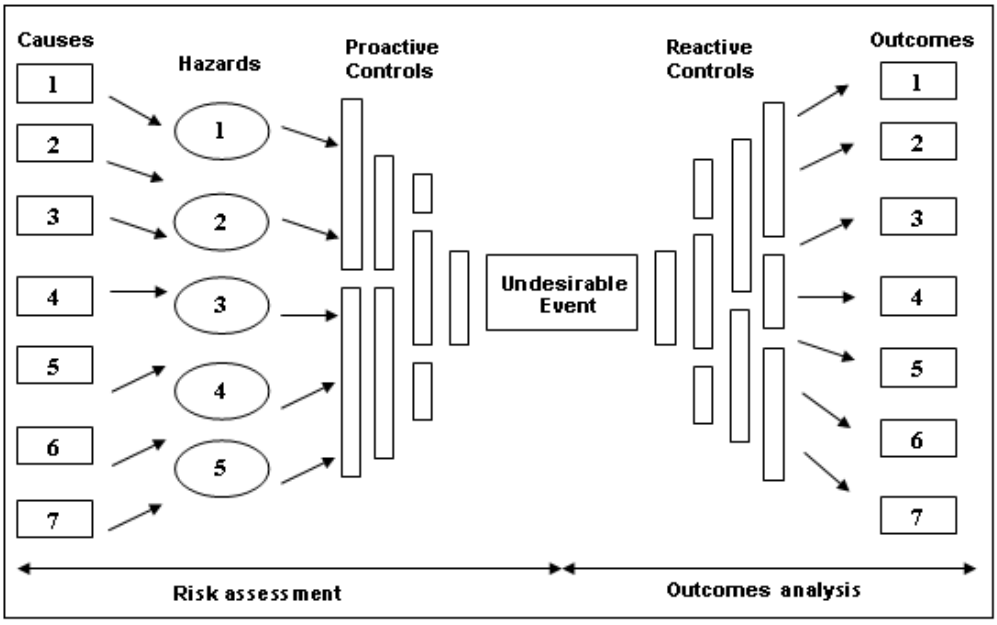
The risk assessment and outcome analysis have to be separated, the result of the second one have not to be connected with the result of the first one.

In risk assessment the team analyze the activity of the company and find the hazard connected with it. These hazard are present simply because the company do an activities, they are inevitable. With mitigations and barriers the team manage to reduce the severity and/or the likelihood to reach a condition of undesirable event, from which there is no more control of situation that can drive to a risk/outcome. In spite of the mitigation, there is however a residual possibility to reach the undesirable event.

Here begins the outcomes analysis: if there is an outcome, in spite all the mitigations, the team has to think about how to minimize the consequences of it through reactive controls. With the effective activation of these controls the consequences of the outcome can be reduced from the level found for the outcomes in the risk assessment to a lower one.

In conclusion the two analysis have only one thing in common: the undesirable event. The risk assessment studies all those controls that have effect before the manifestation of the undesirable event and the outcomes analysis those ones who have effect after it, to reduce the consequences.

***Figure 6.3 Risk assessment and outcomes analysis connection***



# 6.8 Internal reporting

Any hazard that has the potential to cause damage or injury or that threatens our organization has to be reported to be analyzed, mitigated or eliminated to finally increase our level of safety.

Hazard and incidents shall be reported if it is believed that:

- Something can be done to improve safety;
- Other aviation personnel could learn from the report;
- The system and its inherent defenses did not work as expected.

In case of doubt, the hazard has to be reported.

It is responsibility of all employees to report any difficulties and hazards encountered during his activities in the organization.

The employee should report in writing any difficulties or problems through a report and forward it to the Safety Manager using the form shown in table 6. The report may be submitted anonymously. The Company have to supply the empty forms and a box to collect the filled in ones.

Once hazard are reported, they must be acknowledged and investigated. Recommendations and actions must also follow to direct the safety issues.

This kind of report should also be allowed for the reporting of hazard associated with the activities of any contracting agency and/or company, where they may be a safety impact.

Anyevent or situation with the potential to result in significant degradation of safety and which could cause damage and/or injury, should be reported.

The reporting system maintains confidentially between the person reporting the hazard and the Safety Manager.

The safety reports, received by the Safety Manager, should be distributed to the Post Holders concerned, if considered necessary by the Safety Manager.

It is responsibility of the Safety Manager to assess the reports received, to identify the deficiencies and to take, if necessary, the appropriated actions to solve the item and/or to minimize its effects.

For internal reporting has to be used the form used even for the occurrence report and showed in table 9.1 of part 9 of this manual.

# PART 7

# Safety performance monitoring

# 7.1 Management evaluation

Every six months a Safety Board meeting will be done. The meeting is managed by the Accountable Manager with the support of Safety Manager and Quality Manager.

The participants will be at least:

- Accountable Manager;
- Safety Manager;
- Quality Manager;
- Maintenance Manager;
- CAMO Post Holder;

Depending of the agenda, other Post Holders could be invited.

During Management Evaluation the following topics will be analyzed:

- Safety performance against the safety policy and objectives;
- The effectiveness of the SMS implementation plan;
- Internal reporting forms received and analyzed;
- Key indicators;

Minutes must be recorded for circulation to the Accountable Manager and all other members, as well as other staff as appropriate.

The details of safety improvements derived from these meetings should be widely communicated throughout the Company.

Department Heads should also hold regular meetings with their staff to allow safety concerns and ideas to be discussed.

The purpose of this committee is also co-ordinate the required processes to ensure that the operations of the Company and its sub-contractors are safe as reasonably possible.

In the firs meeting of the year the Accountable Manager shall also define the “next Year” strategic goals and safety objectives and keys indicators.

An extraordinary meeting may be called if the Accountable Manager, or the Safety Manager, consider it necessary (e.g. following a major incident).

# PART8

# Incident reporting and investigation

# 8.1 Occurrence reporting

The occurrence reporting system is an essential part of the overall monitoring function.

The objective of the occurrence reporting, collection, investigation and analysis system is to use the reported information to contribute to the improvement of aviation safety.

The detailed objectives of the occurrence reporting system are:

- To enable an assessment of the safety implications of each occurrence to be made, including previous similar occurrences, so that any necessary action can be initialed. This includes determining what and why it had occurred and what might prevent a similar occurrence in the future;
- To ensure that knowledge of occurrences is disseminated so that other persons and organizations may learn from them.

The occurrence reporting system is a tool to identify those occasions where routine procedures have failed.

Report may be transmitted using the form show in the table 7.1. the amount of information in the report should be commensurate whit the severity of the occurrence.

Each report should at least contain the following elements, as applicable to each activity:

- Department name;
- Information necessary to identify the aircraft or part affected;
- Date and time when relevant;
- A written summary of the occurrence;
- Any other specific information required.

# 8.2 Mandatory Occurrence Reporting

The Mandatory Occurrence Reporting to the Authority is performed according to the relevant procedures in the manuals M.O.E. and C.A.M.E of the Company.

# 8.3 Analysis and investigation closure

For every occurrence the Safety Manager has to investigate what are the reasons or causes that could have been the origin of the occurrence, and has to issue a report which shall include the description of the event, the analysis, the risk assessment and consequent mitigation actions in order to obtain an acceptable risk level.

Anyway the fundamental purpose of the reporting activity and reports evaluation is to be non-punitive.

***Table 8.1 Occurrence/hazard reporting form***

| **Type of report** | □ Occurrence<br>□ Hazard | | | | |
|---|---|---|---|---|---|
| **Identification of the aircraft** | | | | | |
| Type of Aircraft | Version | S/N | Flight hours | Customer | Country |
| | | | | | |
| **Circumstances** | | | | | |
| DATE: | | PLACE: | | | |
| **Select the categories concerned - Maintenance phase:** | | | | | |
| □ Scheduled maintenance<br>□ Unscheduled maintenance<br>□ Repair<br>□ Training/maintenance | | □ Towing<br>□ Refuelling<br>□ Pre-flight inspection<br>□ Post- flight inspection | | | |
| **Maintenance conditions - Select the relevant area (ATA Chapter)** | | | | | |
| □ 21 Air-conditioning system<br>□ 22 Automatic pilot<br>□ 23 Communication system<br>□ 24 Electrical System<br>□ 28 Fuel system<br>□ 29 Hydraulic system<br>□ 31 Recording/information system<br>□ 32 Landing gear/skids<br>□ 33 Lights/lamps<br>□ 34 Navigation system/flight data | □ 36 Pneumatic system<br>□ 39 Electrical/electronic equip. & panel<br>□ 49 External power generation system<br>□ 52 Doors and protection covers<br>□ 53 Fuselage<br>□ 55 Stabilizer<br>□ 56 Windshield and windows<br>□ 62 Main rotor<br>□ 63 Main rotor controls | □ 64 Anti-torque rotor<br>□ 65 Anti-torque rotor controls<br>□ 67 Flight controls<br>□ 71/72 Electrical installation<br>□ 73 Power supply system<br>□ 74 Lighting system<br>□ 76/77 Engine control and indicators<br>□ 79 Oil cooling system<br>□ 80 Engine start-up system<br>□ Other:_____ | | |
| **Relevant assembly or component** | Description P/N | Type of operation | Documentation of maintenance used | | |
| | | | Type/ref.: | Rev. Nbr: | Version: |
| **Description of the occurrence** | | | | | |
| Explain how the event occurred, why it occurred or why it did not result in an accident or describe the hazard: | | | | | |
| In your opinion, what is the likelihood of such an event happening? (tick)<br>Extremely improbable<br>□1 □2 □3 □4 Frequent □5 | | | | | |
| What do you consider could be the worst possible consequence if this event did happen? (tick)<br>Negligible<br>□1 □2 □3 □4 Catastrophic □5 | | | | | |
| Action taken by maintenance staff (or other party) to manage the event | | | | | |
| Proposal to prevent the event from re-occurring or from avoiding that such event result in an accident | | | | | |
| **Signature** | | | | | |
| Reporter:<br>(can be anonymous) | | Safety Manager: | Hazard Report n° | | |
| | | | Occurrence Report n° | | |

Some reports can be closed on receipt; for some others the follow-up is required, and in this case, if considered necessary also with the Safety Board involvement, the requested action will be assigned to the appropriated department(s).

The Quality Manager has the responsibility to monitor the implementation of actions proposed and to evaluate the effectiveness.

The Safety Manager will review the response and, if satisfactory, he/she will recommend closure of the incident at the next Safety Board meeting. If responses are unsatisfactory and do not resolve the problem, the incident must remain open for continuing review and action required.

Anyone submitting a report must receive acknowledgement and feed-back via e-mail or directly from the Safety Manager.

After investigation is completed, the safety report and the subsequent recommendations should be made available for the benefit of all the concerned staff.

# 8.4 Management of reports

The table 8.2 summarize how the report are managed.

***Table 8.2 Reports management***

| Step | Remarks | Responsibility |
|---|---|---|
| Establish report | - Describe the situation<br>- Use the designated form<br>- Assign report to the responsible manager within 24 hours<br>- Initiate preventive and corrective action (who, what, due date) | Safety Manager |
| Sort and assign report | - Give feedback to the issuer<br>- Assess the risk<br>- Assign responsible manager to realize action<br>- Open item on "list of pending items" | Safety Manager |
| Analyze situation and initiate measures | - Ensure reporting to the National Aviation Authority within 72 hours if needed<br>- Initiate preventive and corrective action (who, what, due date) | Safety Manager and Relevant Post Holders |
| Monitor realization of measure | | Safety Manager and Quality Manager |
| Close measure | - Close measure on "Safety Report Monitoring" | Safety Manager |
| Monitor effectiveness of measure | - During spot checks/inspections or audits<br>- Is the improvement sustainable?<br>- Did we get the attained success? | Safety Manager and Quality Manager |

# 8.5 Safety investigations

Investigation includes the gathering and analysis of information, the drawing of conclusion, including the determination of causes and, when appropriated, the publication of safety recommendations.

They must be conducted in case of:

- Accidents and serious incidents;
- Risk-assessed occurrences classified as "unacceptable";
- Recurring safety issues.

The Safety Manager have to appoint an Investigation Team, that shall include at least the relevant Post Holder and the Quality Manager; additional members could be appointed depending the analysis to be performed (i.e. Certifying Staff).

The investigation procedure is explained in the table 7.3.

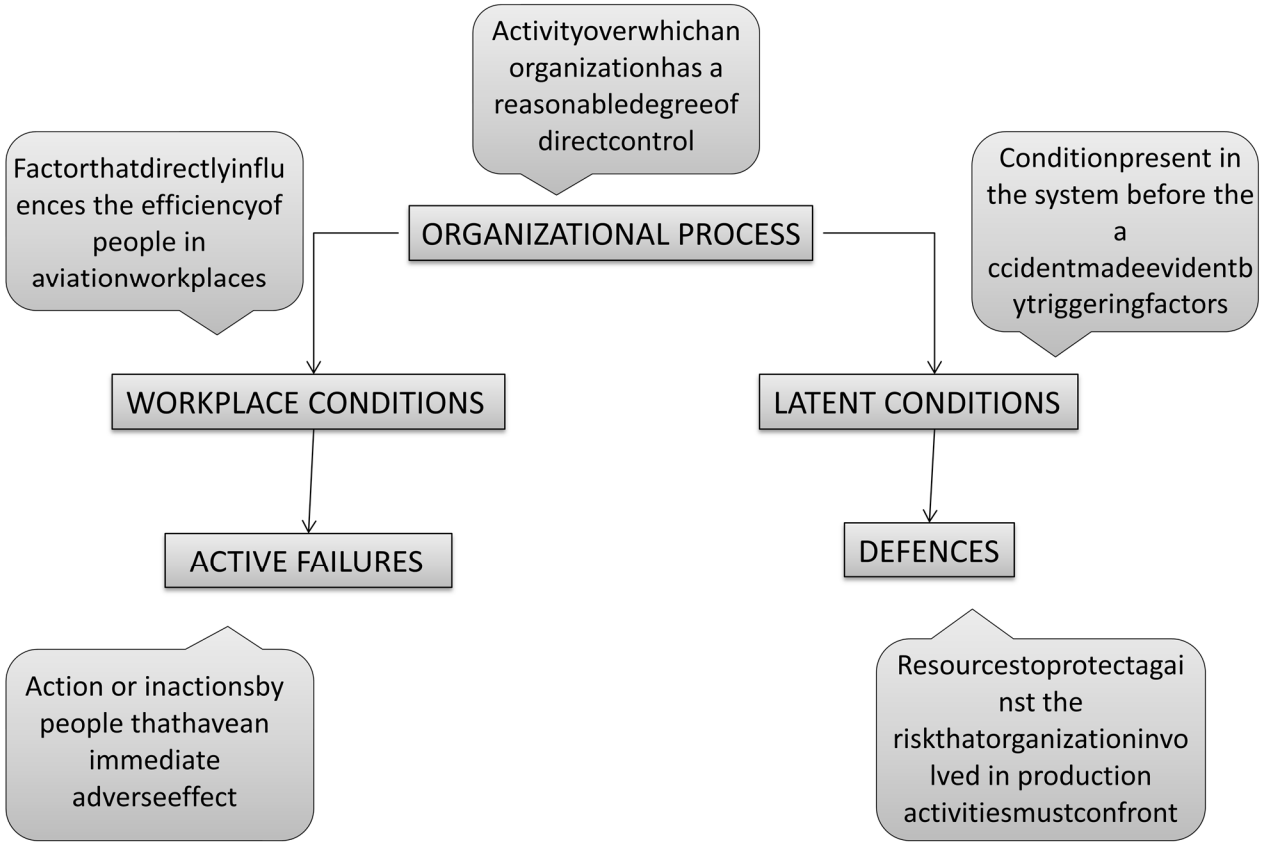
***Table 8.4 Investigation Procedure***

| Step | Remarks | Responsibility |
|---|---|---|
| Decide to investigate or not | - Initiate Investigation Team | Safety Manager and Quality Manager |
| Plan activities | - Define and assign activities<br>- Define need for assistance of specialists | Safety Manager and Investigation Team |
| Data collection | - Identify events and underlying factors<br>- Identify and validate perceived safety hazards<br>- Relevant sources may be:<br>- Physical examination<br>- Documentation and records<br>- Interviews<br>- Direct observation of actions<br>- Simulations<br>- Specialist advice<br>- Safety database | Investigation Team |
| Sequence of events | Reconstruct logical progression | Investigation Team |
| Integrated investigations | - Analyze facts and determine findings regarding underlying factors and hazards | Investigation Team |
| Risk assessment | - Estimate risk and determine acceptability for each hazard | Investigation Team |
| Defense analysis | - Identify defenses that are missing or in adequate | Investigation Team |
| Risk control analysis | - Identify and evaluate risk control options, including when necessary escalation factors | Investigation Team |
| Safety communication | - Communicate safety message and/or recommendations to stakeholders | Investigation Team |
| Close investigation | - Store records | Investigation Team |

The risk assessment required by the procedure have to be done using the form for the risk assessment explained in Part 6 of this manual.

To collect the data can be useful to follow the investigation concept of James Reason, showed in figure 8.2.

***Figure8.2 James Reason investigation concept***




To find the causes of an incident the organizational process of all those activities over which the organization has a reasonable degree of direct control have to be investigated.

James Reason makes a significant distinction between active and latent failures in context of incident causation. Active failures are often focus of remedial action although is the latent failures that may be more significant with respect to wider and continuing risk exposure.

Active failures are the errors and violations that occur l close proximity to the incident and are often described as the immediate cause. An active failure originate from the workplace conditions that directly influence the efficiency of people in aviation workplaces.

Latent failures are more distant from the event in organizational time and space and may or may not be easy to identify. As such, they may or may not feature as system or root causes as a result of investigation. A latent failure is the cause of the incident when a defense against it did not work.

A successful incident investigation process must have the capability to identify the key latent failures and address these so as to maximize the learning opportunity and to prevent re-occurrence and the wider risk issues.

# PART9

# Emergency Response Planning

The ERP concept is based on ICAO SMM, Doc.9859 (2nd Ed./2009), and AMC1 ORA.GEN.200 (a)(3).

# 9.1 Governing policies

The Company ERP provides direction for responding to emergencies, taking into account type and scale of operations, complexity of the Company organization and national and international laws in force.

ERP is designed to ensure:

- An orderly and safe transition from normal to emergency operations;
- Safe continuation of operations or return to normal operations as soon as practicable;
- Coordination with the ERPs of other organizations, where appropriate.

# 9.2 Events which may activate the ERP

The following events may result in a crisis situation and activate the ERP:

- Aviation accident/ Serious accident
- Disaster in the premises: fire, explosion, pollution, flood
- Loss of working resources: workshop, offices, hangar, aircraft
- Impact of a disaster in the vicinity of the establishment
- Climatic event: , storm, flood, lightning
- Natural disaster: earthquake
- Death, suicide at the workplace;
- Social movements;
- Internal or external threat;
- Accident during mission: business trip, abroad.

# 9.3 Definitions

The definitions below are defined in ICAO Appendix 13, Chapter 1.

***Accident***: an occurrence associated with the operation of an aircraft which take place between the time any person board the aircraft with the intention of flight until such time as all persons have disembarked, in which:

a) A person is fatally or seriously injured as a result of:
   - Being in the aircraft, or
   - Direct contact with any part of the aircraft, including parts which have become detached from the aircraft

except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew.

b) The aircraft sustains damage or structural failure:
   - Which adversely affects the structural strength, performance of flight characteristics of the aircraft and
   - Would normally require major repair or replacement of the affected component, except for engine failure or damage, when damage is limited to the engine, its cowlings or accessories,; or for damage is limited to propellers, wing tips, antennas, tires, brakes, fairings, small dents or puncture holes in the aircraft skin, or

c) The aircraft is missing or is completely inaccessible.

Incident: an occurrence, other than an accident, associated with the operation of the aircraft which affects or could affect the safety of operation.

Serious incident: an incident involving circumstances indicating that an accident nearly occurred.

Fatal injury: an injury resulting in death within 30 days of the date of the accident.

Serious injury: an injury which is sustained by a person in an accident which:

a) Requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; or
b) Results in a fracture of any bone (except simple fractures of fingers, toes or nose); or
c) Involves lacerations which cause severe hemorrhage, nerve, muscle or tendon damage; or
d) Involves injury to any internal organ; or
e) Involves second- or third-degree burns or any burns affecting more than 5% of the body surface; or
f) Involves verified exposure to infections substances or injurious radiation.

# 9.4 Organization

The quality department is the point of contact and it is responsible for disseminating the alert to the organization managers (Accountable Manager, Safety Manager and the relevant Post Holders) and the relevant official authorities.

To prevent unnecessary delay, the nominated contact must have immediate access to the following:

- An up to date list of managers to be contacted and their deputies in the case of absence;
- A list of emergency services and officials organization to be contacted in the event of an emergency.

All employees have to know their role in case of the occurrence of a serious event, how to raise the alert and take the right immediate action.

For this purpose, once a year an emergency training exercise will be organize to practice and refine the procedures and to train personnel.

Whenever possible the normal activity of the organization must be maintained. To this end, employees whose activity is not affected by the situation should continue to carry out their normal duties. Personnel should, however, contact their family and friends to reassure them in an attempt to prevent congest of external communication.

If the presence of an employee is not required at the accident/incident site, or at the location of the Crisis Management Team, they should be discouraged from going to these locations so as not to hinder the emergency services and/or any investigation team(s).

The personnel not involved in the management of the situation do not contact the Crisis Management Team or speak to the media.

When ERP is activated no external communication shall be released by Company personnel without written authorization by the Accountable Manager.

## 9.5 Reaction to an emergency call

Whenever the Company is made aware of an accident or incident, the person or department who receive the alert must endeavor to establish the following information point:

- Date and time of the call;
- Name and contact details of the informant;
- Establish the authenticity of the call (where possible);
- In the vent that the call is made anonymously, try and obtain information concerning the other party and their position;
- Initiate the alert process both in house and externally.

The form in table 9.1 permit to record all the information.

The direct contact details for the members of the Crisis Management Team and the Emergency Services must be readily accessible and up to date.

The in-house contact are:

- Accountable Manager;
- Safety Manager;
- Maintenance Manager
- The personnel who have to manage human resources, communication and legal matters.

External contacts are:

- Emergency Medical Service;
- Fire and rescue Service;
- The air control Service
- Police.

***Table 9.1 Primary accident information sheet***

| | |
|---|---|
| Date | |
| Time | |
| Details of the person giving the alert | |
| Aircraft Details<br>- Type<br>- Registration<br>- Persons on board (crew/pax) | |
| Location f the accident | |
| Consequence for the crew<br><br>*Bodily and property* | |
| Consequence for the passengers<br><br>*Bodily and material* | |
| Consequence for third parties on ground<br><br>*Bodily and material* | |
| Consequence for the aircraft<br><br>*Description of damage* | |
| Other information | |

# 9.6 Crisis Management Center

If necessary a Crisis Management Center should be establish at the organization headquarters and a suitable accommodation will be dedicated. Crisis Management Center shall coordinate also the Company ERP with the local airport ERP (where applicable).

Once the Crisis Management Center ha been activated, all events, decisions and subsequent actions must be recorded in a Crisis Log. This will ensure that an accurate record of action taken in response to the emergency situation is retained.

A form for the crisis log is shown in table 9.2.

Every member of the Crisis Management Center have his tasks:

- **Accountable Manager**: has to manage internal operation by relying on the members of the crisis management center and draw-up in conjunction with the communication manager and lawyer the release to the media, including the appointment of a spokesperson to communicate with the media. Where possible ho should not do this himself.
  He has the task to ensure that the activities of the company are maintained if these activities are not affected by the event. He shall inform. If necessary, the National Aviation authorities.
- **Safety Manager**: has draw-up conclusion for the SMS database regarding previous occurrences and risk assessment, mitigation and control concerning the safety risk reveled by the event at hand and provide the information to the Accountable Manager to enable him to protect the Company reputation. He has to perform the internal safety investigations.
- **Communication Manager**: interfaces between the organization and the press by ensuring that only relevant and accurate information is provided without prejudicing the investigation in any way.
- **Human Resources**: advise personnel of the situation and actions to be taken and provide with the necessary logistics and equipment to the personnel assigned to carry out any duty at the accident location. It has to initiate that the organization plan for dealing with the emotional trauma of personnel and, if necessary, contact the medical support.
- **Maintenance Manager**: he has to compile the administrative documents relating to maintenance of the aircraft involved in the accident and its continuing airworthiness along with all records of maintenance carried out on the aircraft and its system including airframe, engine(s), mgb, rotor and rotor head and anti-torque rotor and have it available for the investigating authorities. Ha has to provide the investigating authorities copies of licenses and training records of the maintenance personnel and assist them. He ha also to help in organizing the protection of the accident scene and recovery of the wreckage as requested by the investigating authorities.
- **Lawyer**: examine and vet any statements prior to them being issued and provide information as applicable on legal issues pertaining to the accident.

***Table 9.2 Crisis Log***

| **Description of the event:** | | | | |
|---|---|---|---|---|
| **Date of the event:** | | **Time of the event:** | | |
| **Location of the event:** | | | | |
| **Activation date of the crisis management center:** | | | | **Time:** |
| **Composition of the crisis management center:**<br>- **Accountable Manager**<br>- **Safety Manager**<br>- **Communication Manager**<br>- **Human Resources**<br>- **Maintenance Manager**<br>- **Lawyer** | | **Names:** | | **Contact:** |
| **Person in charge of drawing up the log:** | | | | |
| **DATE** | **TIME** | **DECISION** | **ACTIONS** | **REMARKS** |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Crisis Log** | | | | **Pag..../....** |

# 9.7 Family assistance

Victims familiar shall be assisted by adequate personnel supplied by specialized external bodies (Coce Rossa, Azienda Sanitaria, etc.)

# 9.8 Post occurrence review

Post occurrence the emergency key personnel must carry out a full debriefing and record all significant lessons learned. This may result in amendments being made to the ERP.

# PART 10

# Management of change

In case of:

- A change in the Accountable Manager of the Company;
- A change in the Safety Manager;
- A modification of the name of the Company;
- An expansion of the field of activity of the Company;

the Company complies with the following procedure for communication to the Authority:

- The relevant notifications is forwarded on the headed paper of the Company.

The Accountable Manger is responsible for the notifications concerning the points listed above.

If the changes listed above are planning, the notification to the Authority must be made in writing by post or express courier one month before making the changes.

If the changes listed above are not planned, the notification to the Authority must be made by fax within 48 hours of the changes, and in all cases followed by written communication by post or express courier.

Together with the notification, the Authority should also receive any Company proposal for continuing operations during the implementation of the consequent changes.

# PART 11

# Safety promotion

The policy of the company is to train all employees and tailored to their function on the Safety Management System.

The training is designed to ensure that all personnel understands the objective as laid down the Company organization management system documentation.

The Safety Manager decides about the form of training (hands out, classroom training, e-mail training, etc)

# 11.1 Safety promotion

Safety Promotion is a process aimed at promoting a culture of safety by ensuring that all personnel in an organization are aware that, at their level and in their day-to-day activity, they are key players in safety and that every one, therefore, contributes to an effective SMS.

Managers are an important driving force of effective safety management it is the responsibility of each manager to demonstrate his/hr commitment to safety, to promote safety in everyday activities and to lead by example.

Training and effective communication on safety are two important processes supporting safety promotion.

# 11.2 Training

All personnel receive safety training as appropriate for their safety responsibilities and adequate records of all safety training provided are to be kept.

All personnel receive training to maintain their competencies. This includes notifications of any changes to applicable regulations and rules, company procedures and safety relevant technical matters.

There is a link between training and safety risk management as training and competence development is one of the means through which identified risks can be reduced. Other types of risks controls concern equipment or organizational factors, which can also addressed in training.

# 11.3 Initial training

Every new employee will – with respect on his function – be introduced in the company Safety management System by the Safety Manager.

In the following table is shown the topics of the training in relation to the function of the employee.

***Table11.1 Initial Training***

| Function / Topics (according to SMSM-Chapters) | Accountable Manager | Post Holders | Safety Manager | Quality Manager | Auditor | Technicians | Part M Subpart G Personnel | Logistic & Secretary personnel |
|---|---|---|---|---|---|---|---|---|
| Safety Policy, Organization & Documentation | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Introduction to Safety & Risk-Management | ✓ | ✓ | ✓ | ✓ | ✓ | -- | -- | -- |
| Risk Management | ✓ | ✓ | ✓ | ✓ | -- | -- | -- | -- |
| Feedback & Reporting | -- | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Inspections | -- | -- | ✓ | ✓ | ✓ | -- | -- | -- |
| Audits | -- | -- | ✓ | ✓ | ✓ | -- | -- | -- |
| Subcontractor / Supplier Management | -- | ✓ | ✓ | ✓ | -- | -- | -- | -- |
| Safety Investigations | ✓ | ✓ | ✓ | ✓ | -- | -- | -- | -- |
| Emergency Response Planning | ✓ | ✓ | ✓ | ✓ | -- | ✓ | ✓ | ✓ |
| Management Evaluation | ✓ | ✓ | ✓ | ✓ | -- | -- | -- | -- |
| Safety Promotion, Training and Education | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Every new employee has to understand:

- The main elements of the safety policy;
- He organization, roles and responsibilities concerning SMS and his/her own role in SMS;
- The company safety objectives;
- The various roles and responsibilities in the ERP and his/her own role;
- Means and procedures for reporting occurrences and hazards;
- The safety risk management process and his/her own role in it;
- The principles of continuous improvement of safety performance;
- The basic principles of compliance monitoring;
- The company responsibilities when contracting activities.

# 11.4 Specific training

The following table shows the topics of specific training in relation to the function.

***Table11.2 Specific Training***

| Function / Topics (specific training course) | Accountable Manager | Post Holders | Safety Manager | Quality Manager | Auditor | Technicians | Part M Subpart G Personnel | Logistic & Secretary personnel |
|---|---|---|---|---|---|---|---|---|
| Relevant regulations and related AMCs, GMs | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Specific Quality Manager Course | -- | -- | -- | ✓ | -- | -- | -- | -- |
| Specific Auditor's Training | -- | -- | ✓ | -- | ✓ | -- | -- | -- |
| Specific Risk Management course | ✓ | ✓ | ✓ | ✓ | -- | -- | ✓ | ✓ |

# 11.5 Communication

The company will establish an effective communication system that ensures that all personnel are aware of safety management activities as appropriate to their safety responsibilities, conveys safety critical information, especially related to assessed risks and analyzed hazards, explains why particular action are taken and why safety procedures are introduced or changed.

Communications also reinforces the commitment of everyone to report hazards and occurrences and provides feedback to reporters, that is an essential condition for communication, which is a two way process.

Regular meetings are organized with the personnel to communicate safety maters and discuss information, action and procedures.

Communication has to be kept simple and appropriate to maximize effect, involve all personnel, and reinforce personal and team commitment to safety.

Communication has to be open to encourage discussion and develop the safety culture.

The company uses the following means of communication:

- Safety meetings every 6 months;
- E-mail and suggestion boxes;
- Safety information from the OEMs, the authorities, Helicopters association and from national and international Safety Initiatives;
- Newsletters;
- Digests of accidents and incident;
- Digest of safety studies, audit reports and safety reviews;
- Subscription to publication and journals.

# PART 12

# Contracted Activities

If the Company should decide to contract certain activities to external organizations, the following requirements will apply:

- A written agreement should exist between the Company and the contracted organization clearly defining the contracted activities and the applicable requirements. In the agreement the contracted organization shall ensure access to the Company Safety Manager and Quality Manager and to Aviation Authorities for audit/inspection activities;
- The contracted safety related activities relevant to the agreement should be included in the Company safety management and compliance monitoring program;
- The Company should ensure that the contracted organization has the necessary authorization or approval when required, and commands the resources and competence to undertake the task.

# 12.1 Responsibility when contracting activities

Regardless of the approval status of the contracted organization, the Safety Manager is responsible to ensure that all contracted activities are subject to hazard identification and risk management.

Before activating the agreement, the relevant Post Holder has to inform the Safety Manager and the Quality Manager and obtain acceptance in relation to their respective risk assessment and monitoring activities.

A Contracted Organization list shall be issued and updated. Any change to this list shall be notified to Safety Manager and Compliance Monitoring Manager,

# ANNEX I

# Gap analysis

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
|---|---|---|---|---|---|---|
| **1 SAFETY POLICY** | | | | | | |
| **IMPEGNO E RESPONSABILITÀ DEL MANAGEMENT – MANAGEMENT COMMITTMENT AND RESPONSABILITY** | | | | | | |
| 1. | SMM (Doc 9859) Chapt. 8 ENAC 6.1 /BDCA | È presente una safety policy? | Is there a safety policy in place? | | | |
| 2. | SMM (Doc 9859) Chapt. 8 ENAC 6.1 / BDCA | La safety policy è scritta e approvata dall' Accountable Manager? | Is the safety policy signed by the Accountable Manager? | | | |
| 3. | SMM (Doc 9859) Chapt. 3 and 8 | La safety policyriflette l'impegno dell'azienda riguardo il *safety management*? | Does the safety policy reflect organizational commitments regarding safety management? | | | |
| 4. | SMM (Doc 9859) Chapt. 3 and 8 | La safety policy comprende una dichiarazione chiara circa la messa a disposizione di risorse necessarie alla safety policy stessa? | Does the safety policy include a clear statement about the provision of the necessary resources for the implementation of the safety policy? | | | |
| 5. | SMM (Doc 9859) Chapt. 3 and 8 | La safety policy include le procedure di *safety reporting*? | Does the safety policy include the safety reporting procedures? | | | |

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
|---|---|---|---|---|---|---|
| 6. | SMM (Doc 9859) Chapt. 8 | La safety policy indica chiaramente qualitipi di comportamenti operativisono inaccettabili? | Does the safety policy clearly indicate which types of operational behaviours are unacceptable? | | | |
| 7. | SMM (Doc 9859) Chapt. 8 | La safety policy include le condizioni in cui si può applicare un'eccezione dalle azioni disciplinari? | Does the safety policy include the conditions under which exemption from disciplinary action would be applicable? | | | |
| 8. | SMM (Doc 9859) Chapt. 8 ENAC 6.1 | La safety policy è stata comunicata in modo efficace in tutta l'azienda? | Is the safety policy communicated, with visible endorsement, throughout the organization? | | | |
| 9. | SMM (Doc 9859) Chapt. 8 | La safety policy è periodicamente aggiornata per assicurarne rilevanza e appropriatezza per l'azienda? | Is the safety policy periodically reviewed to ensure it remains relevant and appropriate to the organization? | | | |
| 10. | SMM (Doc 9859) Chapt. 8 | Esiste unprocesso formaleper svilluppareun insieme coerente di obiettivi di sicurezza? | Is there a formal process to develop a coherent set of safety objectives? | | | |
| 11. | SMM (Doc 9859) Chapt. 8 | Gli obiettivi di sicurezza sono legati agli indicatori di prestazione, agli obbiettivi e ai requisiti di sicurezza? | Are the safety objectives linked to the safety performance indicators, safety performance targets and safety requirements? | | | |

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
|---|---|---|---|---|---|---|
| 12. | SMM (Doc 9859) Chapt. 8 | Gli obiettivi di sicurezza sono resi pubblici e distribuiti? | Are the safety objectives publicized and distributed? | | | |
| 13. | ENAC 6.1 | Il *senior management* promuove continuamente e dimostra il proprio impegno per la safety policy? | Does the senior management continuously promote the safety policy and disclose its commitment about it? | | | |
| 14. | ENAC 6.1 | La safety policy copre tutti i punti delle linee guida? | Does the safety policy follow all the guidelines? | | | |
| **1.2 RESPONSABILITÀ SULLA SICUREZZA – SAFETY ACCOUNTABILITIES** | | | | | | |
| 15. | ENAC 6.3 | La struttura di gestione dell'organizzazione è stata definita? | Has been defined the organization management structure? | | | |
| 16. | SMM (Doc 9859) Chapt. 8 and 10 | L'organizzazione ha identificato un Accountable Manager che, a prescindere da altre funzioni, abbia la responsabilità ultima in nome dell'organizzazione sulla implementazione e sul mantenimento del SMS? | Has the organization identified an Accountable Manager who, irrespective of other functions, shall have ultimate responsibility and accountability, on behalf of the organization, for the implementation and maintenance of the SMS? | | | |

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
|---|---|---|---|---|---|---|
| 17. | SMM (Doc 9859) Chapt. 8 BDCA | L'Accountable manager ha la responsabilità di assicurare che il SMS sia adeguatamente implementato e soddisfi i requisiti in ogni area dell'organizzazione? | Does the Accountable Manager have responsibility for ensuring that the safety management system is properly implemented and performing to requirements in all areas of the organization? | | | |
| 18. | SMM (Doc 9859) Chapt. 8 ENAC 6.2 | L'Accountable Manager ha il pieno controllo delle risorse finanziarie richieste per le operazioni in modo che possano essere condotte secondo gli standard richiesti? | Does the Accountable Manager have full control of the financial resources required for the operations authorized to be conducted under the approval certificate? | | | |
| 19. | SMM (Doc 9859) Chapt. 8 | L'Accountable Manager ha il pieno controllo delle risorse umane richieste per le operazioni in modo che possano essere condotte secondo gli standard richiesti ? | Does the Accountable Manager have full control of the human resources required for the operations authorized to be conducted under the approval certificate? | | | |
| 20. | SMM (Doc 9859) Chapt. 8 | L'Accountable Manager ha responsabilità diretta nella gestione quotidiana della organizzazione? | Does the Accountable Manager have direct responsibility for the conduct of the organization's affairs? | | | |

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
|---|---|---|---|---|---|---|
| 21. | SMM (Doc 9859) Chapt. 8 | L'Accountable Manager ha l'autorità sulle operazioni svolte in osservanza dell'Approvazione della organizzazione? | Does the Accountable Manager have final authority over operations authorized to be conducted under the approval certificate? | | | |
| 22. | SMM (Doc 9859) Chapt. 8 and 10 ENAC 6.2, 6.3 BDCA | L'organizzazione ha definito le responsabilità di tutti i membri del *management*, a prescindere da altre funzioni, nonché dei dipendenti in rispetto delle prestazioni del SMS? | Has the organization identified the accountabilities of all members of management, irrespective of other functions, as well as of employees, with respect to the safety performance of the SMS? | | | |
| 23. | SMM (Doc 9859) Chapt. 8 ENAC 6.2 | Le autorità e le responsabilità in ambito della sicurezza sono state chiaramente definite, documentate? | Are the safety responsibilities, accountabilities and authorities clearly defined, documented? | | | |
| 24. | SMM (Doc 9859) Chapt. 8 ENAC 6.2 | Le autorità e le responsabilità in ambito della sicurezza sono state chiaramente comunicate nell'azienda? | Are the safety responsibilities, accountabilities and authorities clearly communicated throughout the organization? | | | |
| 25. | SMM (Doc 9859) Chapt. 8 | L'azienda ha definite quali livelli del *management* hanno l'autorità per prendere decisioni riguardo la tollerabilità dei rischi? | Has the organization Included a definition of the levels of management with authority to make decisions regarding safety risk tolerability? | | | |

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
|---|---|---|---|---|---|---|
| **1.3 NOMINA DEL PERSONALE CHIAVE SULLA SICUREZZA – APPOINTMET OF KEY SAFETY PERSONNEL** | | | | | | |
| 26. | SMM (Doc 9859) Chapt. 8 ENAC 6.3 BDCA | L'azienda ha nominato una persona qualificata che gestisca e supervisioni le operazioni quotidiane del SMS, cioè un Safety Manager? | Has the organization appointed a qualified person to manage and oversee the day-to-day operation of the SMS, i.e. a Safety Manager? | | | |
| 27. | SMM (Doc 9859) Chapt. 8 ENAC 6.3 | Il Safety Manager ha adeguate esperienze, basi culturali, conoscenze e comprensione del SMS? | Does the safety manager have the suitable experience, cultural background, knowledge and comprehension of SMS? | | | |
| 28. | ENAC 6.3 | Le persone competenti in materia di safety si incontrano regolarmente e le riunioni sono verbalizzate? | Does the safety personnel regularly meet and are these meetings documented? | | | |
| **1.4 COORDINAMENTO DEI PIANI DI EMERGENZA – COORDINATION OF EMERGENCY RESPONSE PLANNING** | | | | | | |
| 29. | SMM (Doc 9859) Chapt. 8 BDCA | L'azienda ha sviluppato un piano di risposta di emergenza appropriato per le dimensioni, la natura e la complessità dell'azienda stessa? | Does the organization have an emergency response / contingency plan appropriate to the size, nature and complexity of the organization? | | | |
| 30. | ENAC 6.4 | Il piano di risposta di emergenza è mantenuto aggiornato? | Does the organization revise the emergency response plan? | | | |

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
|---|---|---|---|---|---|---|
| 31. | ENAC 6.4 | Il piano di risposta di emergenza è regolarmente rivisto e testato? | Is the emergency response plan properly reviewed and tested? | | | |
| 32. | SMM (Doc 9859) Chapt. 8 | L'azienda coordina le procedure del suo piano di risposta di emergenza con quelle delle aziende con cui deve interagire durante la prestazione del servizio? | Does the organization coordinate its emergency response/contingency procedures with the emergency / response contingency procedures of other organizations it must interface with during the provision of services? | | | |
| 33. | SMM (Doc 9859) Chapt. 8 | L'azienda ha stabilito un processo per diffondere e comunicare le procedure di coordinazione al personale coinvolto nelle stesse? | Does the organization have a process to distribute and communicate the coordination procedures to the personnel involved in such interaction? | | | |
| 34. | ENAC 6.4 | I ruoli, le responsabilità e le azioni del personale chiave sono definite nel piano di risposta di emergenza? | Are the roles, the accountabilities and the activities of the key safety personnel defined in the emergency response plan? | | | |
| 35. | ENAC 6.4 | Il piano di risposta di emergenza include tutte le considerazioni delle linee guida, se appropriate? | Does the emergency response plan include all the observations of the guidelines, if appropriated? | | | |

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
|---|---|---|---|---|---|---|
| **1.6 DOCUMENTAZIONE DEL SMS – SMS DOCUMENTATION** | | | | | | |
| 36. | SMM (Doc 9859) Chapt. 4 and 8 ENAC 6.5 | Esiste un adeguato sistema per la registrazione, la conservazione e la gestione della documentazione e delle registrazioni del SMS? | Has the organization developed a suitable record system to maintain a safety library for appropriate hazard documentation and documentation management? | | | |
| 37. | SMM (Doc 9859) Chapt. 4 and 8 | L'azienda ha sviluppato e mantiene una documentazione del SMS in forma cartacea o elettronica? | Has the organization developed and maintain SMS documentation in paper or electronic form? | | | |
| 38. | ENAC 6.5 | Il manuale del SMS, o la documentazione sulla safety contenuta nei manuali esistenti, contiene tutti gli elementi richiesti? | Does the SMS manual, or the safety documents contained in other already existent manuals, include all the required aspects? | | | |
| 39. | SMM (Doc 9859) Chapt. 7, 8 and 10 | La documentazione del SMS è sviluppata in modo che descriva il SMS e le relazioni reciproche tra tutti i componenti del SMS? | Is the SMS documentation developed in a manner that describes the SMS and the consolidated interrelationships between all the SMS components? | | | |
| 40. | SMM (Doc 9859) Chapt. 8 and 10 | Il piano di implementazione assicura che il SMS soddisfi gli obiettivi di sicurezza dell'azienda? | Does the implementation plan ensure that the SMS meets the organization's safety objectives? | | | |

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
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| 41. | SMM (Doc 9859) Chapt. 8 and 10 | Il piano di implementazione dell'SMS è stato sviluppato da una persona o un gruppo di pianificazione con una appropriata esperienza? | Has the SMS implementation plan been developed by a person or a planning group which comprises an appropriate experience base? | | | |
| 42. | SMM (Doc 9859) Chapt. 8 and 10 | La persona o il gruppo di pianificazione hanno ricevuto sufficienti risorse (incluso il tempo per gli incontri) per sviluppare il piano di implementazione del SMS? | Has the person or planning group received enough resources (including time for meetings) for the development of the SMS implementation plan? | | | |
| 43. | SMM (Doc 9859) Chapt. 8 | Il piano di implementazione del SMS è stato approvato dal *senior management* dell'azienda? | Is the SMS implementation plan endorsed by the senior management of the organization? | | | |
| 44. | SMM (Doc 9859) Chapt. 8 ENAC | Il piano di implementazione del SMS è regolarmente sottoposto a revisione da parte del *senior manager* dell'azienda? | Is the SMS implementation plan regularly reviewed by the senior management of the organization? | | | |
| 45. | SMM (Doc 9859) Chapt. 8 and 10 | Il piano di implementazione dell'SMS propone un'implementazione dell'SMS in fasi? | Does the SMS implementation plan propose an implementation of the SMS in phases? | | | |

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| 46. | SMM (Doc 9859) Chapt. 8 | Il piano di implementazione del sistema SMS descrive esplicitamente il coordinamento fra il SMS dell'organizzazione e quello di altre organizzazioni con le quale l'Impresa deve interagire nella fornitura dei propri servizi? | Does the SMS implementation plan explicitly address the coordination between the service provider SMS and the SMS of other organizations the organization must interface with during the provision of services? | | | |
| 47. | SMM (Doc 9859) Chapt. 8 | Il manuale del SMS (SMSM) è stato sviluppato come strumento chiave per comunicare l'approccio della sicurezza dell'azienda nei confronti della sicurezza all'interno dell'azienda stessa? | Has the safety management system manual (SMSM) been developed as a key instrument for communicating the organization's approach to safety to the whole organization? | | | |
| 48. | SMM (Doc 9859) Chapt. 8 | Il SMSM documenta tutti gli aspetti del SMS, inclusa la safety policy, gli obiettivi, le procedure e le responsabilità sulla sicurezza dei singoli soggetti? | Does the SMSM document all aspects of the SMS, including among others the safety policy, objectives, procedures and individual safety accountabilities? | | | |
| 49. | SMM (Doc 9859) Chapt. 8 | Il SMSM descrive chiaramente il ruolo della gestione dei rischi come attività iniziale e il ruolo "safety assurance" come attività continuativa? | Does the SMSM clearly articulate the role of safety risk management as initial design activity and the role of safety assurance as continuous activity? | | | |

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| 50. | SMM (Doc 9859) Chapt. 8 | Una parte rilevante della documentazione del SMS è incorporata in documenti approvati come *Company Operations Manual, Maintenance Control / Policy Manual, Airport Operations Manual, etc.*? | Are relevant portions of SMS related documentation incorporated into approved documentation, such as Company Operations Manual, Maintenance Control/Policy Manual, Airport Operations Manual, etc., as applicable? | | | |
| 51. | SMM (Doc 9859) Chapt. 8 | L'azienda ha un sistema di registrazione che assicura la generazione e la conservazione di tutte le registrazioni necessarie per documentare e supportare i requisiti operativi? | Does the organization have a record system that ensures the generation and retention of all records necessary to document and support operational requirements? | | | |
| 52. | SMM (Doc 9859) Chapt. 8 | Il sistema di registrazione è in accordo con i requisiti del regolamento applicabile e le "best practices" dell'azienda? | Is the records system in accordance with applicable regulatory requirements and industry "best practices"? | | | |

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| 53. | SMM (Doc 9859) Chapt. 8 | Il sistema di registrazione fornisce i processi di controllo necessari per assicurare appropriata identificazione, leggibilità, archiviazione, protezione, recupero, tempo di conservazione e disponibilità delle registrazioni? | Does the records system provide the control processes necessary to ensure appropriate identification, legibility, storage, protection, archiving, retrieval, retention time, and disposition of records? | | | |
| **2 SAFETY RISK MANAGEMENT** | | | | | | |
| **2.1 HAZARD IDENTIFICATION** | | | | | | |
| 54. | SMM (Doc 9859) Chapt. 3 and 9 ENAC 6.2 | L'azienda ha un ufficiale "safety data collection and processing system" (SDCPS) per raccogliere informazioni (da segnalazioni obbligatorie e volontarie) riguardo i pericoli? | Does the organization have a formal safety data collection and processing system (SDCPS) for effectively collecting information (from obligatory and voluntary advisory) about hazards in operations? | | | |
| 55. | ENAC 6.3 | Esiste una procedura scritta che descrive come viene effettuata l'identificazione dei pericoli? | Is there a written procedure that describes how to identify the hazards? | | | |
| 56. | ENAC 6.3 | I rischi maggiori associati con l'organizzazione sono stati individuati? | Have the major risks associated with the organization been individuated? | | | |

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| 57. | SMM (Doc 9859) Chapt. 3, 4 and 9 | Il SDCPS include una combinazione di metodi reattivi, proattivi e predittivi per la sicurezza? | Does the organization SDCPS include a combination of reactive, proactive and predictive methods of safety data collection? | | | |
| 58. | SMM (Doc 9859) Chapt. 3, 9 and 10 | L'azienda mette in atto processi reattivi per raccogliere informazioni rilevanti per la gestione della sicurezza e dei rischi? | Does the organization have reactive processes that provide for the capture of information relevant to safety and risk management? | | | |
| 59. | SMM (Doc 9859) Chapt. 9 and 10 | È stata sviluppata una formazione per i metodi reattivi di raccolta di dati sulla sicurezza? | Has the organization developed a training relevant to reactive methods of safety data collection? | | | |
| 60. | SMM (Doc 9859) Chapt. 9 and 10 | È stata sviluppata una forma di comunicazione per i metodi reattivi di raccolta di dati sulla sicurezza? | Has the organization developed communication relevant to reactive methods of safety data collection been developed? | | | |
| 61. | SMM (Doc 9859) Chapt. 9 | I resoconti reattivi sono semplici, accessibili e proporzionati alle dimensioni dell'azienda? | Is reactive reporting simple, accessible and commensurate with the size of the organization? | | | |
| 62. | SMM (Doc 9859) Chapt. 9 and 10 ENAC 6.2 | I resoconti reattivi sono esaminati ad un livello appropriato del management? | Are reactive reports reviewed at the appropriate level of management? | | | |

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| 63. | SMM (Doc 9859) Chapt. 9 ENAC 6.2 | Esiste un processo di feedback che notifica che I resoconti sono stati ricevuti e per condividere I risultati delle analisi? | Is there a feedback process to notify contributors that their reports have been received and to share the results of the analysis? | | | |
| 64. | SMM (Doc 9859) Chapt. 3, 9 and 10 BDCA | L'azienda mette in atto processi proattivi che cercano attivamente di identificare i rischi per la sicurezza attraverso l'analisi delle attività dell'organizzazione stessa? | Does the organization have proactive processes that actively look for the identification of safety risks through the analysis of the organization's activities? | | | |
| 65. | SMM (Doc 9859) Chapt. 9 and 10 | È stata sviluppata una formazione per i metodi proattivi di raccolta di dati sulla sicurezza? | Is there training relevant to proactive methods of safety data collection? | | | |
| 66. | SMM (Doc 9859) Chapt. 9 and 10 | È stata sviluppata una forma di comunicazione per i metodi proattivi di raccolta di dati sulla sicurezza? | Has the organization developed communication relevant to proactive methods of safety data collection? | | | |
| 67. | SMM (Doc 9859) Chapt. 9 | I resoconti proattivi sono semplici, accessibili e proporzionati alle dimensioni dell'azienda? | Is proactive reporting simple, accessible and commensurate with the size of the organization? | | | |

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
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| 68. | SMM (Doc 9859) Chapt. 3, 9 and 10 | L'Impresa ha instaurato dei processi "predittivi" che permettono di estrapolare dati di performance nelle attività quotidiane | Does the organization have predictive processes that provide the capture of system performance as it happens in real-time normal operations? | | | |
| 69. | SMM (Doc 9859) Chapt. 9 and 10 | È stata sviluppata una formazione per i metodi predittivi di raccolta di dati sulla sicurezza? | Is there training relevant to predictive methods of safety data collection? | | | |
| 70. | SMM (Doc 9859) Chapt. 9 | È stata sviluppata una forma di comunicazione per i metodi predittivi di raccolta di dati sulla sicurezza? | Has the organization developed communication relevant to predictive methods of safety data collection? | | | |
| 71. | SMM (Doc 9859) Chapt. 9 | Il processo di raccolta di dati predittivi sulla sicurezza è proporzionato alle dimensioni dell'azienda? | Is the predictive safety data capture process commensurate with the size of the organization? | | | |
| 2.2 VALUTAZIONE DEL RISCHIO E MITIGAZIONE – RISK ASSESMENT AND MITIGATION | | | | | | |
| 72. | ENAC 7.4 BDCA | È in atto un adeguato sistema di valutazione dei rischi? | Is there a proper risk assessment system? | | | |

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| 73. | SMM (Doc 9859) Chapt. 9 and 10 | L'azienda ha sviluppato e mantiene un processo ufficiale che assicura l'analisi e il controllo dei rischi per la sicurezza nelle operazioni svolte dall'azienda stessa? | Has the organization developed and maintains a formal process that ensures analysis, assessment and control of the safety risks in the organization operations? | | | |
| 74. | ENAC 7.4 | Nel processo di valutazione dei rischi sono incluse le persone in possesso della necessaria competenza ed esperienza? | Are in the risk assessment process included persons with the appropriate competence and experience? | | | |
| 75. | SMM (Doc 9859) Chapt. 4, 9 and 10 | La documentazione del SMS dell'azienda articola chiaramente le relazioni tra pericoli, conseguenze e rischi per la sicurezza? | Does the organization SMS documentation clearly articulate the relationship between hazards, consequences and safety risks? | | | |
| 76. | SMM (Doc 9859) Chapt. 5 and 9 | È in atto un processo strutturato per l'analisi dei rischi per la sicurezza associate alle loro conseguenze per identificare i pericoli, espresso in termini di probabilità e severità del loro verificarsi? | Is there a structured process for the analysis of the safety risks associated to the consequences of identified hazards, expressed in terms of probability and severity of occurrence? | | | |

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| 77. | SMM (Doc 9859) Chapt. 5 and 9 | Ci sono dei criteri per valutare i rischi per la sicurezza e stabilire la loro tollerabilità (ad esempio il livello di rischio che l'azienda intende accettare)? | Are there criteria for assessing safety risks and establishing safety risk tolerability (i.e., the acceptable level of safety risk the organization is willing to accept? | | | |
| 78. | ENAC 7.7 | La matrice di tollerabilità del rischio è appropriata e può essere applicata in modo coerente? | Is the risk tolerability matrix appropriate and can it be used in a coherent way? | | | |
| 79. | ENAC 7.8 | Esiste un processo per decidere le mitigazioni del rischio necessarie? | Is there a process for the decision of the necessary risk mitigations? | | | |
| 80. | ENAC 7.8 | Le mitigazioni dei rischi ed i controlli sono sottoposti a verifica/audit per confermarne l'efficacia? | Are the risk mitigations and controls submitted to test/audit to confirm the effectiveness? | | | |
| 81. | SMM (Doc 9859) Chapt. 5 and 9 | Esistono strategie di mitigazione dei rischi per la sicurezza che includono piani d'azione correttive/preventive per prevenire la ricomparsa di circostanze e carenze segnalate? | Are there safety risk mitigation strategies that include corrective/ preventive action plans to prevent recurrence of reported occurrences and deficiencies? | | | |

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| 82. | ENAC 7.8 | I rischi sono gestiti ad un livello ragionevole? | Are the risks managed at a reasonable level? | | | |
| 83. | ENAC 7.9 | I rischi e I pericoli sono registrati su un *hazard log*? | Are risks and hazards reported in a *hazard log*? | | | |
| 84. | ENAC 7.9 | L'*hazard log* viene rivisto periodicamente? | Is the *hazard log* periodically reviewed? | | | |
| **3 GARANZIA DI SICUREZZA – SAFETY ASSURANCE** | | | | | | |
| **3.1 SAFETY PERFORMANCE MONITORING** | | | | | | |
| 85. | SMM (Doc 9859) Chapt. 9 and 10 BDCA | L'azienda ha implementato un processo interno con cui viene verificata la safety performance per verificare l'efficacia dei "safety controls"? | Has the organization implemented internal process by which the safety performance of the organization is verify and to validate the effectiveness of safety risks controls? | | | |

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| 86. | SMM (Doc 9859) Chapt. 9 | I seguenti strumenti sono inclusi in tale processo?<br>Safety reporting systems □Yes □No<br>Safety studies □Yes □No<br>Safety reviews □Yes □No<br>Safety audits □Yes □No<br>Safety surveys □Yes □No<br>Internal safety investigations □Yes □No | Are the following tools included in those processes?<br>Safety reporting systems □Yes □No<br>Safety studies □Yes □No<br>Safety reviews □Yes □No<br>Safety audits □Yes □No<br>Safety surveys □Yes □No<br>Internal safety investigations □Yes □No | | | |
| 87. | SMM (Doc 9859) Chapt. 6 and 9 ENAC 8.1 | Sono stati definiti gli indicatori di prestazione di sicurezza? | Have the safety performance indicators been defined? | | | |
| 88. | SMM (Doc 9859) Chapt. 9 | I safety reports sono controllati da un adeguato livello del management? | Are safety reports reviewed at the appropriate level of management? | | | |
| 89. | SMM (Doc 9859) Chapt. 6 and 9 ENAC 8.1 | Gli indicatori di prestazione di sicurezza sono rivisti regolarmente per identificare eventuali trend? | Are the safety performance regularly reviewed to identify possible trends? | | | |
| 90. | SMM (Doc 9859) Chapt. 9 | È in atto un processo per monitorare e analizzare i trend? | Is there a process in place to monitor and analyze trends? | | | |

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| 91. | ENAC 8.6 | Vengono effettuati audit e ispezioni al fine di verificare l'efficacia dei "safety controls" e delle mitigazioni? | Does the organization carry out audit and inspections to verify the effectiveness of safety controls and mitigations? | | | |
| 92. | SMM (Doc 9859) Chapt. 9 | Esiste un processo di feedback per notificare a chi ha fatto una segnalazione che questa è stata ricevuta e per condividere i risultati dell'analisi di questa? | Is there a feedback process to notify contributors that their reports have been received and to share the results of the analysis? | | | |
| 93. | SMM (Doc 9859) Chapt. 9 | Vengono generate azioni correttive e preventive in risposta all'identificazione di un pericolo? | Are corrective and preventive actions generated in response to hazard identification? | | | |
| 94. | SMM (Doc 9859) Chapt. 9 | Sono in atto procedure per condurre indagini interne? | Are there procedures in place for the conduct of internal investigations? | | | |
| 95. | SMM (Doc 9859) Chapt. 9 | È in atto un processo per assicurare che circostanze e mancanze segnalate siano analizzate per identificare tutti i pericoli associati? | Is there a process to ensure that occurrences and deficiencies reported are analyzed to identify all associated hazards? | | | |

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| 96. | SMM (Doc 9859) Chapt. 9 | Esiste un processo per valutare l'efficacia delle misure correttive/preventive che sono state sviluppate? | Is there a process for evaluating the effectiveness of the corrective/ preventive measures that have been developed? | | | |
| 97. | SMM (Doc 9859) Chapt. 9 | Esiste un sistema per monitorare il processo di segnalazione interna e le misure correttive associate? | Is there a system to monitor the internal reporting process and the associated corrective actions? | | | |
| 98. | SMM (Doc 9859) Chapt. 9 | Esiste un processo di selezione / addestramento per assicurare l'obiettività e la competenza degli auditors così come l'imparzialità del processo di auditing? | Are there selection/training processes to ensure the objectivity and competence of auditors as well as the impartiality of the audit process? | | | |
| 99. | SMM (Doc 9859) Chapt. 9 | Esiste una procedura per segnalare i risultati dell'audit e per mantenerne la registrazione? | Is there a procedure for reporting audit results and maintaining records? | | | |
| 100. | SMM (Doc 9859) Chapt. 9 | Esiste una procedura che delinea i requisiti per un'azione tempestiva e preventiva in risposta dei risultati? | Is there a procedure outlining requirements for timely corrective and preventive action in response to audit results? | | | |

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| 101. | SMM (Doc 9859) Chapt. 9 | Esiste una procedura per registrare la verifica delle azioni intraprese e la segnalazione dei risultati della verifica? | Is there a procedure to record verification of action(s) taken and the reporting of verification results? | | | |
| 3.2 GESTIONE DEL CAMBIAMENTO – MANAGEMENT OF CHANGE | | | | | | |
| 102. | ENAC 8.2 BDCA | Esiste un processo per identificare in modo proattivo i pericoli e per mitigare i rischi in caso di cambiamenti significativi nell'organizzazione? | Is there a process to proactively identify hazards and to mitigate risks when a relevant change in the organization happen? | | | |
| 103. | SMM (Doc 9859) Chapt. 9 | L'azienda ha sviluppato e mantiene un processo ufficiale per identificare i cambiamenti all'interno della organizzazione che possono interessare processi e servizi consolidati? | Has the organization developed and maintains a formal process to identify changes within the organization which may affect established processes and services? | | | |
| 104. | SMM (Doc 9859) Chapt. 9 | Il processo ufficiale per la gestione del cambiamento analizza i cambiamenti nelle operazioni o il personale chiave per i rischi della sicurezza? | Does the formal process for the management of change analyze changes to operations or key personnel for safety risks? | | | |

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| 105. | SMM (Doc 9859) Chapt. 9 | L'azienda ha istituito disposizioni per assicurare il mantenimento delle prestazioni attinenti alla sicurezza prima di implementare i cambiamenti? | Has the organization established arrangements to ensure safety performance prior to implementing changes? | | | |
| 106. | SMM (Doc 9859) Chapt. 9 | L'azienda ha istituito un processo per eliminare o modificare i controlli sui rischi della sicurezza che non sono più necessari in seguito ai cambiamenti? | Has the organization established a process to eliminate or modify safety risk controls that are no longer needed due to changes in the operational environment? | | | |
| GESTIONE DEGLI INCONVENIENTI –INCONVENIENCE MANAGEMENT | | | | | | |
| 107. | ENAC 8.3 | Vengono svolte indagini sulla safety dopo incidenti o inconvenienti per stabilire le loro cause ultime? | Are investigation carried out after an accident or an inconvenience to establish their ultimate causes? | | | |
| 108. | ENAC 8.3 | I pericoli individuati dalle indagini relative alla sicurezza sono appropriatamente indirizzati e sono comunicati al resto dell'azienda e alle pertinenti aziende terze con le quali l'azienda si interfaccia? | Are the hazards found by the safety investigations appropriately addressed to the whole organization and to third organizations that interface with it? | | | |

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
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| **3.3 MIGLIORAMENTO CONTINUO DEL SMS – CONTINUOUS IMPROVEMENT OF THE SMS** | | | | | | |
| 109. | ENAC 8.4 | Viene ottenuto il miglioramento continuo delle prestazioni di sicurezza? | Does the SMS reach the continuous improvement of the safety performance? | | | |
| 110. | SMM (Doc 9859) Chapt. 9 | L'azienda ha sviluppato e mantiene un processo ufficiale per identificare le cause di prestazioni al di sotto degli standard? | Has the organization developed and maintains a formal process to identify the causes of sub-standard performance of the SMS? | | | |
| 111. | SMM (Doc 9859) Chapt. 9 | L'azienda ha istituito un meccanismo per determinare le implicazioni della prestazione al di sotto degli standard delle operazioni del SMS? | Has the organization established a mechanism(s) to determine the implications of sub-standard performance of the SMS in operations? | | | |
| 112. | SMM (Doc 9859) Chapt. 9 | L'azienda ha istituito un meccanismo per eliminare o mitigare le cause delle performance al di sotto degli standard del SMS? | Has the organization established a mechanism(s) to eliminate or mitigate the causes of substandard performance of the SMS? | | | |

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
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| 113. | SMM (Doc 9859) Chapt. 9 | L'azienda mette in atto un processo di valutazione proattiva delle strutture, degli equipaggiamenti, della documentazione e delle procedure (attraverso audit e sondaggi, ecc.)? | Does the organization have a process for the proactive evaluation of facilities, equipment, documentation and procedures (through audits and surveys, etc.)? | | | |
| 114. | SMM (Doc 9859) Chapt. 9 | L'azienda mette in atto un processo per la valutazione proattiva delle performance individuali per verificare l'adempimento delle responsabilità sulla sicurezza? | Does the organization have a process for the proactive evaluation of the individuals' performance, to verify the fulfillment of their safety responsibilities? | | | |
| | | | COMPLIANCE MONITORING | | | |
| 115. | ENAC 8.5 BDCA | Esiste una funzione di monitoraggio della rispondenza ai regolamenti applicabili a ai requisiti aggiuntivi stabiliti dall'azienda ("compliance monitoring")? | Is there a monitoring function for the compliance with the applicable rules and the additional requirements established by the organization? | | | |

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
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| 116. | ENAC 8.5<br>BDCA | Il processo di verifica di rispondenza ai requisiti comprende la verifica del rispetto delle procedure che l'azienda ha stabilito per assicurare la sicurezza delle operazioni? | Does the compliance monitoring process include the test of the observance of the procedures established by the organization to ensure the safety of the operations? | | | |
| 117. | ENAC 8.5 | L'Accountable Manager ha designato un "Compliance Monitoring Manager", non coincidente con uno dei responsabili (rif. ORO/A.GEN210 (b)), in possesso delle richieste competenze? | Has the Accountable Manager identified a Compliance Monitoring Manager, not holding also the position of a manager (rif. ORO/A.GEN210 (b)), who has the required competence? | | | |
| 118. | ENAC 8.5 | Il "Compliance Monitoring Manager" ha accesso diretto all'Accountable Manager? | Does the Compliance Monitoring Manager have direct access to the Accountable Manager? | | | |
| 119. | ENAC 8.5 | Il "Compliance Monitoring Manager" ha accesso a tutte le parti della organizzazione e, se necessario, delle organizzazioni contrattate? | Does the Compliance Monitoring Manager have direct access to all the parts of the organization and, if needed, to the third organizations? | | | |

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
|---|---|---|---|---|---|---|
| 120. | ENAC 8.5 | Gli audit e le ispezioni sono effettuati da personale non responsabile per la funzione, procedura o prodotto auditato? | Are audits and inspections carried out by personnel not accountable for the audited function, procedure or product? | | | |
| 121. | ENAC 8.5 | È stata definita la documentazione relativa al "compliance monitoring"? | Is a documentation concerning compliance monitoring defined? | | | |
| 122. | ENAC 8.5 | Il Compliance Monitoring Manager e gli eventuali auditor hanno ricevuto appropriato addestramento? | Has the Compliance Monitoring Manager and the auditors received an appropriate training? | | | |
| 123. | ENAC 8.5 | Il processo di compliance monitoring assicura l'efficace implementazione e follow-up delle azioni correttive? | Does the compliance monitoring process ensure the effective implementation and follow-up of the corrective actions? | | | |
| **4 PROMOZIONE DELLA SICUREZZA – SAFETY PROMOTION** | | | | | | |
| **4.1 FORMAZIONE ED ISTRUZIONE – TRAINING AND EDUCATION** | | | | | | |
| 124. | ENAC 9.1 BDCA | Il personale è stato opportunamente addestrato rispetto al SMS e ai relativi ruoli e responsabilità inerenti la sicurezza? | Is the personnel properly trained for the SMS and for their safety position and accountabilities? | | | |

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
|---|---|---|---|---|---|---|
| 125. | SMM (Doc 9859) Chapt. 9 BDCA | Esiste un processo documentato per identificare i requisiti di formazione così che il personale sia formato e competente per assolvere i compiti del SMS? | Is there a documented process to identify training requirements so that personnel are trained and competent to perform the SMS duties? | | | |
| 126. | SMM (Doc 9859) Chapt. 9 | Esiste una formazione sulla sicurezza appropriata per l'inserimento del singolo nel SMS? | Is the safety training appropriate to the individual's involvement in the SMS? | | | |
| 127. | SMM (Doc 9859) Chapt. 9 | La formazione della sicurezza è inclusa nella formazione post-assunzione? | Is the safety training incorporated into initial training upon employment? | | | |
| 128. | SMM (Doc 9859) Chapt. 9 | Esiste una formazione di risposta di emergenza per il personale che può essere interessato? | Is there emergency response/contingency training for affected personnel? | | | |
| 129. | SMM (Doc 9859) Chapt. 9 BDCA | Esiste un processo per misurare l'efficacia della formazione? | Is there a process that measures the effectiveness of training? | | | |
| **4.2 COMUNICAZIONE PER LA SICUREZZA – SAFETY COMMUNICATION** | | | | | | |
| 130. | SMM (Doc 9859) Chapt. 9 | È in atto un processo di comunicazione nell'azienda che permette al SMS di funzionare efficacemente? | Are there communication processes in place within the organization that permit the safety management system to work effectively? | | | |

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
|---|---|---|---|---|---|---|
| 131. | SMM (Doc 9859) Chapt. 9 | I processi di comunicazione (scritti, incontri, elettronici, ecc.) sono proporzionati alla grandezza e agli scopi dell'azienda? | Are there communication processes (written, meetings, electronic, etc.) commensurate with the size and scope of the organization? | | | |
| 132. | SMM (Doc 9859) Chapt. 9 | Sono definite quali sono le informazioni critiche per la sicurezza, e sono conservate in modo tale da fornire istruzioni riguardo documenti rilevanti del SMS? | Is safety critical information established and maintained in a suitable medium that provides direction regarding relevant SMS documents? | | | |
| 133. | SMM (Doc 9859) Chapt. 9 | Le informazioni critiche per la sicurezza diffuse nell'azienda e l'efficacia della comunicazione sono controllate? | Are safety critical information disseminated throughout the organization and the effectiveness of safety communication monitored? | | | |
| 134. | SMM (Doc 9859) Chapt. 9 | Esiste una procedura che spiega perché vengono intraprese determinate azioni per la sicurezza e perché delle procedure vengono introdotte o modificate? | Is there a procedure that explains why particular safety actions are taken and why safety procedures are introduced or changed? | | | |
| 135. | ENAC 9.2 BDCA | Le informazioni inerenti la sicurezza vengono comunicate a tutto il personale, come appropriato? | Are the safety information communicated to all the personnel, as appropriate? | | | |

| N° | Riferimento | Aspetto da analizzare o domanda | Aspects to be analyzed or question to be answered | Risposta Sì/No/ Parziale | § of SMS manual | Stato dell'implementazione |
|---|---|---|---|---|---|---|
| 136. | ENAC 9.2 | Le informazioni inerenti la sicurezza raggiungono gli utenti esterni/clienti? | Does the safety information reach external users/customers? | | | |
| **IMPLEMENTAZIONE DEL SMS – SMS INPLEMENTATION** | | | | | | |
| 137. | ENAC 10 | È stata effettuata una "gap analisys"? | Did the organization carry out a "gap analysis"? | | | |
| 138. | ENAC 10 | Esiste un piano di implementazione del SMS? | Is there an implementation plan for the SMS? | | | |
| 139. | ENAC 10 | Il piano di implementazione riflette la "gap analisys"? | Does the implementation plan reflect the gap analysis? | | | |
| 140. | ENAC 10 | Il piano di implementazione è rispettato? | Is the implementation plan respected? | | | |

# ANNEX II

# Hazard log and risk analysis

| N° | Hazard | Result of risk assessment |
|---|---|---|
| 1 | Gathering people close to the parking area, the landing or working zone | 2D |
| 2 | Birds | 2E |
| 3 | Landing zone or working area surrounded by debris | 2C |
| 4 | Landing zone or working area surrounded by obstacles | 2C |
| 5 | Landing zone or working area surrounded by populated area | 2E |
| 6 | Time pressure | 2E |
| 7 | Danger linked to the rotors turning on the ground | 2D |
| 8 | FOD | 2E |
| 9 | Absence or lack of markings, beacons on the ground | 2E |
| 10 | Parking zone not protected and left open for access to all (vehicles, pedestrians, animals, etc.) | 2D |
| 11 | Absence of a dedicated parking zone or start up of aircraft | 2D |
| 12 | Maintenance qualification or license expired | 2D |
| 13 | Work documentation not understand by maintenance staff (translation) | 2D |
| 14 | Work documentation not up-to-date | 2B |
| 15 | Airworthiness certificate or equivalent not up-to-date or missing | 2B |
| 16 | Main premises unsuitable (insufficient lighting, heating, sound proofing, protection against weather conditions) | 2C |
| 17 | Use of not compliant parts (forgeries, repairs not inspected by a quality department, etc.) | 2D |
| 18 | Detection of anomalies in the manufacturers documentation | 2B |
| 19 | Lack of maintenance staff | 2E |
| 20 | Fuel not adapted to the type of engine or use | 2C |
| 21 | Polluted fuel | 2C |
| 22 | Maintaining skill | 2C |
| 23 | Pre-requisite for recruitment of technician | 2C |
| 24 | Installation uncompleted | 2E |
| 25 | Damage during installation | 2E |
| 26 | Improper installation | 2E |
| 27 | Part not installed | 2E |
| 28 | Error during failure detection | 2E |
| 29 | Degradation not found | 2E |
| 30 | Improper use of equipment | 3B |
| 31 | Panel or cap not closed | 2E |
| 32 | Technician fatigue | 2E |
| 33 | New personnel in training | 2E |

| | | | | |
|---|---|---|---|---|
| **Activity/operation** | | **Flight test/ignition test** | **N°** | **1** |
| ***"What are the hazard?"*** | | **Gathering people close to the parking plot, the landing or working zone** | **Result** | **2D** |
| **Undesirable events** | | **People, who are not supposed to be in the area, can nor be seen or be in the rotor contrail** | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **01.** Serious injuries<br>- The debris can hit a person | **02.** Collision between people and the aircraft<br>- Less critical for fenestron tail rotor | **03.** Little injuries |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | Markings and fence not to permit the entrance of not authorized people | Markings and fence not to permit the entrance of not authorized people | Markings and fence not to permit the entrance of not authorized people |
| **Assessment** | | | | |
| | **Severity** | Major | Hazardous<br>- There could be a fatality | Minor |
| | **Likelihood** | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | Remote<br>- It occurred in the company |
| | **Result** | Acceptable | ~~Tolerable~~ | Unacceptable |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | | Reflective jackets that must be wear by everyone in the landing zone | |
| | | Implemented / Yes / No | Implemented / Yes / ~~No~~ | Implemented / Yes / No |
| | | | | |
| | | | | |
| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | Acceptable | ~~Tolerable~~ | Unacceptable |
| ***"Action by who?"*** | | | | |
| ***"Action by when?"*** | | | | |
| **Notes** | | **The management accepts the residual risk** | | |
| **Updated on** | | | | |
| **Signature** | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Activity/operation** | | **Flight test** | | **N°** | **2** |
| ***"What are the hazard?"*** | | **Birds** | | **Result** | **2E** |
| **Undesirable events** | | **Bird strike** | | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **04.**Little damages<br>- The impact whit the bird have no severe consequences. | **05.**Structural damage<br>- The bird can impact with the aircraft and damage a window or important components (blade) that can lead to an accident | **06.**Engine shut off or engine damage<br>- More critical for one-engine aircraft, can lead to the need of autorotation | |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | | | Check of the pilot training for autorotation maneuver | |
| **Assessment** | | | | | |
| | **Severity** | Negligible | Catastrophic<br>- In the accidents could there be fatalities and the loss of the aircraft | Minor<br>- There could be injuries and important damage for the engine | |
| | **Likelihood** | Remote<br>- It occurred in the company | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | |
| | **Result** | **Acceptable** | ~~Tolerable~~ | **Unacceptable** | |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | Implemented / Yes / no | Implemented / Yes / No | Implemented / Yes / No | |
| | | | | | |
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| | | | | | |
| | | | | | |
| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** | |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
| **Notes** | | **In the area there are few birds, so the residual risk is considered acceptable.** | | | |
| **Updated on** | | | | | |
| **Signature** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Activity/operation** | | **Flight test/ignition test** | | **N°** | **3** |
| **"*What are the hazard?*"** | | **Landing or working area surrounded by debris** | | **Result** | **2C** |
| **Undesirable events** | | **Debris lifted from ground by the rotor stream** | | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **07.**Equipments damages<br>- The debris can hit equipments and instruments present nearby. | **01.** Serious injuries<br>- The debris can hit a person | **03.** Little injuries | |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | Keep the landing zone clean | Keep the landing zone clean | Keep the landing zone clean | |
| | | Close all the equipment in cases before starting the engine or if an aircraft is going to land | | | |
| **Assessment** | | | | | |
| | **Severity** | Minor | Major | Minor | |
| | **Likelihood** | Remote<br>- It occurred in the company | Improbable<br>- It occurred in the history of aviation | Remote<br>- It occurred in the company | |
| | **Result** | Acceptable | ~~Tolerable~~ | Unacceptable | |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | | Wear suits whit long trousers and sleeves | | |
| | | Implemented / Yes / no | Implemented / Yes / ~~No~~ | Implemented / Yes / No | |
| | | | | | |
| | | | | | |
| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | ~~Acceptable~~ | Tolerable | Unacceptable | |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
| **Notes** | | | | | |
| **Updated on** | | | | | |
| **Signature** | | | | | |

| | | | | |
|---|---|---|---|---|
| **Activity/operation** | | **Flight test** | **N°** | **4** |
| ***"What are the hazard?"*** | | **Landing zone or working area surrounded by obstacles** | **Result** | **2C** |
| **Undesirable events** | | **Collision with unseen obstacles during taxing, take off or landing** | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **03.** Little injuries | **04.** Little damages | **05.** Structural damages<br>- The aircraft can hit the obstacle with structural elements |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | Ground operator who inform the pilot about the obstacles. | Ground operator who inform the pilot about the obstacles. | Ground operator who inform the pilot about the obstacles. |
| | | | | |
| **Assessment** | | | | |
| | **Severity** | Minor | Minor | Major |
| | **Likelihood** | Improbable<br>- It occurred in the history of aviation | Remote<br>- It occurred in the company | Improbable<br>- It occurred in the history of aviation |
| | **Result** | Acceptable | ~~Tolerable~~ | Unacceptable |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | Remove the obstacle, if possible<br>Implemented / Yes / ~~No~~ | Implemented / Yes / No | Implemented / Yes / No |
| | | | | |
| | | | | |
| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | Acceptable | Tolerable | Unacceptable |
| ***"Action by who?"*** | | | | |
| ***"Action by when?"*** | | | | |
| **Notes** | | | | |
| **Updated on** | | | | |
| **Signature** | | | | |

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|---|---|---|---|---|
| **Activity/operation** | | **Flight test** | **N°** | **5** |
| ***"What are the hazard?"*** | | **Landing zone or working area surrounded by populated area** | **Result** | **2E** |
| **Undesirable events** | | **The aircraft, after a catastrophic failure, fall on a populated area** | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **08.** Collision with building<br>- There could be multiple fatalities, loss of the aircraft and serious damage for buildings | **09.** Environmental damage<br>- There is pollution risk because of the aircraft liquids and fuel and an eventual burning | **010.** Reputation damage |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | | | |
| | | | | |
| **Assessment** | | | | |
| | **Severity** | **Catastrophic** | **Major** | **Minor** |
| | **Likelihood** | **Improbable**<br>- It occurred in the history of aviation | **Improbable**<br>- It occurred in the history of aviation | **Improbable**<br>- It occurred in the history of aviation |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** |
| | | | | |
| | | | | |
| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** |
| ***"Action by who?"*** | | | | |
| ***"Action by when?"*** | | | | |
| **Notes** | | **In the nearby the area is not very populated, so the residual risk is considered acceptable** | | |
| **Updated on** | | | | |
| **Signature** | | | | |

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|---|---|---|---|---|---|
| **Activity/operation** | | **Maintenance** | | **N°** | **6** |
| ***"What are the hazard?"*** | | **Time pressure** | | **Result** | **2E** |
| **Undesirable events** | | **The hurry can effect the safety and the some operation can not be done or done in not a correct way** | | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **011.** Failure<br>**03.** Little injuries | **012.** Loss of the aircraft | **013.** Loss of the crew<br>**01.** Serious injuries | |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | The management undertakes not to crate hurry. | The management undertakes not to crate hurry. | The management undertakes not to crate hurry. | |
| | | | | | |
| **Assessment** | | | | | |
| | **Severity** | Major<br>- An other maintenance intervention will be requested | Catastrophic | Catastrophic | |
| | **Likelihood** | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** | |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | | | | |
| | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** | |
| | | | | | |
| | | | | | |
| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** | |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
| **Notes** | | | | | |
| **Updated on** | | | | | |
| **Signature** | | | | | |

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|---|---|---|---|---|---|
| **Activity/operation** | | **Flight test/ignition test** | | **N°** | **7** |
| ***"What are the hazard?"*** | | **Dangers linked to the rotors turning on the ground** | | **Result** | **2D** |
| **Undesirable events** | | **Debris lifted by the airstream can hit persons or equipment, collision with turning tail rotor** | | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **02.** Collision between people and aircraft<br>- Less critical for fenerstron tail rotor | **03.** Little injuries<br>- Caused by debris | **07.** Equipment damage | |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | Only authorized people are allowed during the test | People allowed have to wear proper suits | The zone is kept clean from debris or rubber | |
| | | | | Close all the equipment in cases before starting the engine | |
| **Assessment** | | | | | |
| | **Severity** | Hazardous | Minor | Minor | |
| | **Likelihood** | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | Remote<br>- It occurred in the company | |
| | **Result** | Acceptable | ~~Tolerable~~ | Unacceptable | |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | | People allowed have to wear proper suits | | |
| | | Implemented / Yes / no | Implemented / Yes / ~~No~~ | Implemented / Yes / No | |
| | | | | | |
| | | | | | |
| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | Acceptable | ~~Tolerable~~ | Unacceptable | |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
| **Notes** | | | | | |
| **Updated on** | | | | | |
| **Signature** | | | | | |

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|---|---|---|---|---|
| **Activity/operation** | | **Maintenance** | **N°** | **8** |
| ***"What are the hazard?"*** | | **Foreign Object Damage (FOD)** | **Result** | **2E** |
| **Undesirable events** | | **Presence of foreign object in critical part of the aircraft** | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **011.** Failure<br>**03.** Little injuries | **06.** Engine shut off or engine damage | **014.** Serious failure<br>- Failure on critical mechanical components<br>**01.** Serious injuries<br>**012.** Loss of the aircraft |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | Use of tool cases who permit to check easily the presence of all the tools | Use of tool cases who permit to check easily the presence of all the tools | Use of tool cases who permit to check easily the presence of all the tools |
| | | Double control of the tool cases | Double control of the tool cases | Double control of the tool cases |
| | | Collect all the waste materials in cases | Collect all the waste materials in cases | Collect all the waste materials in cases |
| | | Use protection for the air inlet and probes | Use protection for the air inlet and probes | Use protection for the air inlet and probes |
| | | Use of protection with clearly visible markings, not to forget it before the flight | Use of protection with clearly visible markings, not to forget it before the flight | Use of protection with clearly visible markings, not to forget it before the flight |
| **Assessment** | **Severity** | Major | Minor<br>- There could be important damage for the engine | Catastrophic |
| | **Likelihood** | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | Implemented / Yes / no | Implemented / Yes / No | Implemented / Yes / No |
| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** |
| ***"Action by who?"*** | | | | |
| ***"Action by when?"*** | | | | |
| **Notes** | | | | |
| **Updated on** | | | | |
| **Signature** | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Activity/operation** | | **Flight test/ingnition test** | | **N°** | **9** |
| **"*What are the hazard?*"** | | **Absence or lack of markings, beacons on the ground** | | **Result** | **2E** |
| **Undesirable events** | | **Reduction of the space between the aircraft and possible collision during taxing** | | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **04.** Little damages | **09.** Structural damages | | |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | Markings on the ground periodically checked | Markings on the ground periodically checked | | |
| | | | | | |
| **Assessment** | | | | | |
| | **Severity** | Negligible | Catastrophic | | |
| | **Likelihood** | Remote<br>- It occurred in the company | Improbable<br>- It occurred in the history of aviation | | |
| | **Result** | Acceptable | ~~Tolerable~~ | Unacceptable | |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | Implemented / Yes / no | Implemented / Yes / No | Implemented / Yes / No | |
| | | | | | |
| | | | | | |
| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | Acceptable | Tolerable | Unacceptable | |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
| **Notes** | | | | | |
| **Updated on** | | | | | |
| **Signature** | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Activity/operation** | | **Flight test/ignition test** | | **N°** | **10** |
| **"*What are the hazard?*"** | | **Parking zone not protected and left open for access to all (vehicles, pedestrians, animals, etc.)** | | **Result** | **2D** |
| **Undesirable events** | | **People, vehicles or animal, who are not supposed to be in the area, can nor be seen or be in the rotor contrail** | | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **01.** Serious injuries<br>- The debris can hit a person | **02.** Collision between people and the aircraft<br>- Less critical for fenestron tail rotor | **03.** Little injuries | |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | Markings and fence not to permit the entrance of not authorized people | Markings and fence not to permit the entrance of not authorized people | Markings and fence not to permit the entrance of not authorized people | |
| | | | | | |
| **Assessment** | | | | | |
| | **Severity** | Major | Hazardous<br>- There could be a fatality | Minor | |
| | **Likelihood** | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | Remote<br>- It occurred in the company | |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** | |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** | |
| | | | | | |
| | | | | | |
| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** | |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
| **Notes** | | | | | |
| **Updated on** | | | | | |
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| **Activity/operation** | | **Flight test/ignition test** | **N°** | **11** |
| **"*What are the hazard?*"** | | **Absence of a dedicated parking zone or start up of aircraft** | **Result** | **2D** |
| **Undesirable events** | | **People doing other activity can be in the nearby** | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **01.** Serious injuries<br>- The debris can hit a person | **02.** Collision between people and the aircraft<br>- Less critical for fenestron tail rotor | **03.** Little injuries |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | Markings and fence not to permit the entrance of not authorized people | Markings and fence not to permit the entrance of not authorized people | Markings and fence not to permit the entrance of not authorized people |
| | | | | |
| **Assessment** | | | | |
| | **Severity** | Major | Hazardous<br>- There could be a fatality | Minor |
| | **Likelihood** | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | Remote<br>- It occurred in the company |
| | **Result** | Acceptable | ~~Tolerable~~ | Unacceptable |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | Implemented / Yes / no | Implemented / Yes / No | Implemented / Yes / No |
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| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | Acceptable | Tolerable | Unacceptable |
| ***"Action by who?"*** | | | | |
| ***"Action by when?"*** | | | | |
| **Notes** | | | | |
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| **Activity/operation** | | **Maintenance** | | **N°** | **12** |
| ***"What are the hazard?"*** | | **Maintenance qualification or license expired** | | **Result** | **2D** |
| **Undesirable events** | | **The technician could not be able anymore to do some operation** | | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **012.** Failure | **014.** Serious failure | **01.** Serious injuries<br>**03.** Little injuries | |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | **Periodic check of license** | **Periodic check of license** | **Periodic check of license** | |
| | | | | | |
| **Assessment** | | | | | |
| | **Severity** | **Major** | **Hazardous** | **Major** | |
| | **Likelihood** | **Improbable**<br>- It occurred in the history of aviation | **Improbable**<br>- It occurred in the history of aviation | **Improbable**<br>- It occurred in the history of aviation | |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** | |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | | | | |
| | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** | |
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| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** | |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
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| **Updated on** | | | | | |
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| **Activity/operation** | | **Maintenance** | | **N°** | **13** |
| ***"What are the hazard?"*** | | **Work documentation not understand by maintenance staff (translation)** | | **Result** | **2D** |
| **Undesirable events** | | **Maintenance intervention not correctly done** | | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **012.** Failure | **014.** Serious failure | **01.** Serious injuries<br>**03.** Little injuries | |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | Documentation translated in a language the technician can understand | Documentation translated in a language the technician can understand | Documentation translated in a language the technician can understand | |
| | | Double check to discover incorrect intervention | Double check to discover incorrect intervention | Double check to discover incorrect intervention | |
| **Assessment** | | | | | |
| | **Severity** | Major | Hazardous | Major | |
| | **Likelihood** | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** | |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | | | | |
| | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** | |
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| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** | |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
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| **Activity/operation** | | **Maintenance** | | **N°** | **14** |
| ***"What are the hazard?"*** | | **Work documentation not up-to-date** | | **Result** | **2B** |
| **Undesirable events** | | **Maintenance intervention not correctly done, latest bulletin not adopted** | | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **015.** Need to re-do the maintenance | | | |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | Periodic up-date of documentation | | | |
| | | | | | |
| **Assessment** | | | | | |
| | **Severity** | Minor | | | |
| | **Likelihood** | Improbable<br>- It occurred in the history of aviation | | | |
| | **Result** | ~~Acceptable~~ | | **Tolerable** | **Unacceptable** |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | **Implemented** / **Yes** / **no** | | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** |
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| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | **Acceptable** | | **Tolerable** | **Unacceptable** |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
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| **Activity/operation** | | **Maintenance** | **N°** | **15** |
| ***"What are the hazard?"*** | | **Airworthiness certificate or equivalent not up-to-date or missing** | **Result** | **2B** |
| **Undesirable events** | | **The company can do the release to service** | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **016.** Delay in delivery | **010.** Reputation damage | |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | Periodic check of up-date and validity | Periodic check of up-date and validity | |
| | | | | |
| **Assessment** | | | | |
| | **Severity** | Minor | Minor | |
| | **Likelihood** | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | |
| | **Result** | ~~Acceptable~~ | Tolerable | Unacceptable |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | Implemented / Yes / no | Implemented / Yes / No | Implemented / Yes / No |
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| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | Acceptable | Tolerable | Unacceptable |
| ***"Action by who?"*** | | | | |
| ***"Action by when?"*** | | | | |
| **Notes** | | | | |
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| **Activity/operation** | | **Maintenance** | **N°** | **16** |
| **"*What are the hazard?*"** | | **Main premises unsuitable (insufficient lighting, heating, sound proofing, protection against weather conditions)** | **Result** | **2C** |
| **Undesirable events** | | **The technician can not see defects or can not do his work properly** | | |
| **Potential risks/outcomes** *"Who can be harmed and how? What can be broken and how?"* | | **03.** Little injuries | **011.** Failure | **015.** Need to re-do the maintenance |
| **Existent barrier or mitigation** *"What are you already doing?* | | **The management undertake to supply proper premises** | **The management undertake to supply proper premises** | **The management undertake to supply proper premises** |
| | | | | |
| **Assessment** | | | | |
| | **Severity** | **Minor** | **Major** | **Minor** |
| | **Likelihood** | **Remote**<br>- It occurred in the company | **Improbable**<br>- It occurred in the history of aviation | **Improbable**<br>- It occurred in the history of aviation |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** |
| **Further mitigation** *"do you need to do anything else to control the risk?"* | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** |
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| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** |
| *"Action by who?"* | | | | |
| *"Action by when?"* | | | | |
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| **Activity/operation** | | **Mainteinance** | **N°** | **17** |
| **"*What are the hazard?*"** | | **Use of not compliant parts (forgeries, repairs not inspected by a quality department, etc.)** | **Result** | **2D** |
| **Undesirable events** | | **Failure or need of replacement** | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **011.** Failure<br>**03.** Little injuries | **014.** Serious failure<br>**01.** Serious injuries | **015.** Need to re-do failure |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | Use only of original parts | Use only of original parts | Use only of original parts |
| | | | | |
| **Assessment** | | | | |
| | **Severity** | Major | Hazardous | Minor |
| | **Likelihood** | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation |
| | **Result** | Acceptable | ~~Tolerable~~ | Unacceptable |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | Implemented / Yes / no | Implemented / Yes / No | Implemented / Yes / No |
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| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | Acceptable | Tolerable | Unacceptable |
| ***"Action by who?"*** | | | | |
| ***"Action by when?"*** | | | | |
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| **Activity/operation** | | **Maintenance** | | **N°** | **18** |
| ***"What are the hazard?"*** | | **Detection of anomalies in the manufacturers documentation** | | **Result** | **2B** |
| **Undesirable events** | | **Need to stop the intervention** | | | |
| **Potential risks/outcomes** ***"Who can be harmed and how? What can be broken and how?"*** | | **016.** Delay in delivery | | | |
| **Existent barrier or mitigation** ***"What are you already doing?*** | | | | | |
| | | | | | |
| **Assessment** | | | | | |
| | **Severity** | **Minor** | | | |
| | **Likelihood** | **Improbable**<br>- It occurred in the history of aviation | | | |
| | **Result** | ~~Acceptable~~ | **Tolerable** | | **Unacceptable** |
| **Further mitigation** ***"do you need to do anything else to control the risk?"*** | | | | | |
| | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | | **Implemented** / **Yes** / **No** |
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| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | **Acceptable** | **Tolerable** | | **Unacceptable** |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
| **Notes** | | | | | |
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| **Activity/operation** | | **Maintenance** | | **N°** | **19** |
| ***"What are the hazard?"*** | | **Lack of maintenance staff** | | **Result** | **2E** |
| **Undesirable events** | | **Overwork and time pressure for the technician** | | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **011.** Failure<br>**03.** Little injuries<br>**016.** Delay in delivery | **012.** Loss of the aircraft | **013.** Loss of the crew<br>**01.** Serious injuries | |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | **Works beyond the staff dimension capacity are not accepted** | **Works beyond the staff dimension capacity are not accepted** | **Works beyond the staff dimension capacity are not accepted** | |
| | | | | | |
| **Assessment** | | | | | |
| | **Severity** | **Major** | **Catastrophic** | **Catastrophic** | |
| | **Likelihood** | **Improbable**<br>- It occurred in the history of aviation | **Improbable**<br>- It occurred in the history of aviation | **Improbable**<br>- It occurred in the history of aviation | |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** | |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** | |
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| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** | |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
| **Notes** | | | | | |
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| **Activity/operation** | | **Flight test/ingnition test** | | **N°** | **20** |
| ***"What are the hazard?"*** | | **Fuel not adapted to the type of engine or use** | | **Result** | **2C** |
| **Undesirable events** | | **Problems in burning** | | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **03.** Little injuries | **05.** Engine shut off or engine damage<br>- More critical for one-engine aircraft, can lead to the need of autorotation | | |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | Labels on tank and pump indicating the fuel type | Labels on tank and pump indicating the fuel type | | |
| | | | Check of the pilot training for autorotation maneuver | | |
| **Assessment** | | | | | |
| | **Severity** | Major | Minor | | |
| | **Likelihood** | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | | |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** | |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** | |
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| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** | |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
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| **Activity/operation** | | **Flight test/ignition test** | | **N°** | **21** |
| **"What are the hazard?"** | | **Polluted fuel** | | **Result** | **2C** |
| **Undesirable events** | | **Problems in burning** | | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **03.** Little injuries | **05.** Engine shut off or engine damage<br>- More critical for one-engine aircraft, can lead to the need of autorotation | | |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | Labels on tank and pump indicating the fuel type | Labels on tank and pump indicating the fuel type | | |
| | | | Check of the pilot training for autorotation maneuver | | |
| **Assessment** | | | | | |
| | **Severity** | Major | Minor | | |
| | **Likelihood** | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** | |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** | |
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| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** | |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
| **Notes** | | | | | |
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| **Activity/operation** | **Maintenance** | **N°** | **22** |
| **"What are the hazard?"** | **Maintaining skill** | **Result** | **2C** |

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| **Undesirable events** | | **Failure due to maintenance not done in a proper way** | | |
| **Potential risks/outcomes** *"Who can be harmed and how? What can be broken and how?"* | | **015.** Need to re-do maintenance | **04.** Little damages | **011.** Failure |
| **Existent barrier or mitigation** *"What are you already doing?* | | Keep a calendar with the validity date of the licenses | Keep a calendar with the validity date of the licenses | Keep a calendar with the validity date of the licenses |
| | | | | |
| **Assessment** | | | | |
| | **Severity** | Minor | Negligible | Major |
| | **Likelihood** | Improbable<br>- It occurred in the history of aviation | Remote<br>- It occurred in the company | Improbable<br>- It occurred in the history of aviation |
| | **Result** | Acceptable | ~~Tolerable~~ | Unacceptable |
| **Further mitigation** *"do you need to do anything else to control the risk?"* | | | | |
| | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** |
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| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | - | - | - |
| | **Result** | Acceptable | Tolerable | Unacceptable |
| *"Action by who?"* | | | | |
| *"Action by when?"* | | | | |
| **Notes** | | | | |
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| **Activity/operation** | | **Maintenance** | | **N°** | **23** |
| ***"What are the hazard?"*** | | **Pre-requisite for recruitment of technician** | | **Result** | **2C** |
| **Undesirable events** | | **If is not requested pre-requisite for the recruitment of technicians, people without proper skill could work on the aircraft** | | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **015.** Need to re-do maintenance | **04.** Little damages | **011.** Failure | |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | **Pre-requisite established by the management**<br>**Double check** | **Pre-requisite established by the management**<br>**Double check** | **Pre-requisite established by the management**<br>**Double check** | |
| | | | | | |
| **Assessment** | | | | | |
| | **Severity** | **Minor** | **Negligible** | **Major** | |
| | **Likelihood** | **Improbable**<br>- **It occurred in the history of aviation** | **Remote**<br>- **It occurred in the company** | **Improbable**<br>- **It occurred in the history of aviation** | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** | |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | | | | |
| | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** | |
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| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** | |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
| **Notes** | | | | | |
| **Updated on** | | | | | |
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| **Activity/operation** | | **Maintenance** | **N°** | **24** |
| ***"What are the hazard?"*** | | **Installation uncompleted** | **Result** | **2E** |
| **Undesirable events** | | **Failure during the ignition or flight test** | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **03.** Little injuries<br>**04.** Little damages | **01.** Serious injuries<br>**05.** Structural damages | **011.** Failure<br>**014.** Serious failure |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | **Double check** | **Double check** | **Double check** |
| | | | | |
| **Assessment** | | | | |
| | **Severity** | **Minor** | **Catastrophic** | **Hazardous** |
| | **Likelihood** | **Remote**<br>- It occurred in the company | **Improbable**<br>- It occurred in the history of aviation | **Improbable**<br>- It occurred in the history of aviation |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** |
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| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** |
| ***"Action by who?"*** | | | | |
| ***"Action by when?"*** | | | | |
| **Notes** | | | | |
| **Updated on** | | | | |
| **Signature** | | | | |

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| **Activity/operation** | | **Maintenance** | **N°** | **25** |
| ***"What are the hazard?"*** | | **Damage during installation** | **Result** | **2E** |
| **Undesirable events** | | **Failure during the ignition or flight test** | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **015.** Need to re- do maintenance<br>**03.** Little injuries<br>**04.** Little damages | **01.** Serious injuries<br>**05.** Structural damages | **011.** Failure<br>**014.** Serious failure |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | **Double check to find damages and immediate reparation of the damage** | **Double check to find damages and immediate reparation of the damage** | **Double check to find damages and immediate reparation of the damage** |
| | | | | |
| **Assessment** | | | | |
| | **Severity** | **Minor** | **Catastrophic** | **Hazardous** |
| | **Likelihood** | **Remote**<br>- It occurred in the company | **Improbable**<br>- It occurred in the history of aviation | **Improbable**<br>- It occurred in the history of aviation |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** |
| | | | | |
| | | | | |
| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** |
| ***"Action by who?"*** | | | | |
| ***"Action by when?"*** | | | | |
| **Notes** | | | | |
| **Updated on** | | | | |
| **Signature** | | | | |

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|---|---|---|---|---|
| **Activity/operation** | | **Maintenance** | **N°** | **26** |
| ***"What are the hazard?"*** | | **Improper installation** | **Result** | **2E** |
| **Undesirable events** | | **Failure during the ignition or flight test** | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **015.** Need to re- do maintenance<br>**03.** Little injuries<br>**04.** Little damages | **01.** Serious injuries<br>**05.** Structural damages | **011.** Failure<br>**014.** Serious failure |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | **Double check to discover the improper installation** | **Double check to discover the improper installation** | **Double check to discover the improper installation** |
| | | | | |
| **Assessment** | | | | |
| | **Severity** | **Minor** | **Catastrophic** | **Hazardous** |
| | **Likelihood** | **Remote**<br>- It occurred in the company | **Improbable**<br>- It occurred in the history of aviation | **Improbable**<br>- It occurred in the history of aviation |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** |
| | | | | |
| | | | | |
| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** |
| ***"Action by who?"*** | | | | |
| ***"Action by when?"*** | | | | |
| **Notes** | | | | |
| **Updated on** | | | | |
| **Signature** | | | | |

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|---|---|---|---|---|
| **Activity/operation** | | **Maintenance** | **N°** | **27** |
| ***"What are the hazard?"*** | | **Part not installed** | **Result** | **2E** |
| **Undesirable events** | | **Failure during the ignition or flight test** | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **03.** Little injuries<br>**04.** Little damages | **01.** Serious injuries<br>**05.** Structural damages | **011.** Failure<br>**014.** Serious failure |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | | | |
| | | | | |
| **Assessment** | | | | |
| | **Severity** | **Minor** | **Catastrophic** | **Hazardous** |
| | **Likelihood** | **Remote**<br>- It occurred in the company | **Improbable**<br>- It occurred in the history of aviation | **Improbable**<br>- It occurred in the history of aviation |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | | | |
| | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** |
| | | | | |
| | | | | |
| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** |
| ***"Action by who?"*** | | | | |
| ***"Action by when?"*** | | | | |
| **Notes** | | | | |
| **Updated on** | | | | |
| **Signature** | | | | |

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| **Activity/operation** | | **Maintenance** | **N°** | **28** |
| ***"What are the hazard?"*** | | **Error during failure detection** | **Result** | **2E** |
| **Undesirable events** | | **Problem not found and consequences during ignition and flight test** | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **03.** Little injuries<br>**04.** Little damages | **01.** Serious injuries<br>**05.** Structural damages | **011.** Failure<br>**014.** Serious failure |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | | | |
| | | | | |
| **Assessment** | | | | |
| | **Severity** | **Minor** | **Catastrophic** | **Hazardous** |
| | **Likelihood** | **Remote**<br>- It occurred in the company | **Improbable**<br>- It occurred in the history of aviation | **Improbable**<br>- It occurred in the history of aviation |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | | | |
| | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** |
| | | | | |
| | | | | |
| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** |
| ***"Action by who?"*** | | | | |
| ***"Action by when?"*** | | | | |
| **Notes** | | | | |
| **Updated on** | | | | |
| **Signature** | | | | |

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|---|---|---|---|---|
| **Activity/operation** | | **Maintenance** | **N°** | **29** |
| ***"What are the hazard?"*** | | **Degradation not found** | **Result** | **2E** |
| **Undesirable events** | | **Degradation not repaired and problems during ignition and flight test** | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **03.** Little injuries<br>**04.** Little damages | **01.** Serious injuries<br>**05.** Structural damages | **011.** Failure<br>**014.** Serious failure |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | The maintenance is done by technicians with the proper experience | The maintenance is done by technicians with the proper experience | The maintenance is done by technicians with the proper experience |
| | | | | |
| **Assessment** | | | | |
| | **Severity** | Minor | Catastrophic | Hazardous |
| | **Likelihood** | Remote<br>- It occurred in the company | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation |
| | **Result** | Acceptable | ~~Tolerable~~ | Unacceptable |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | Implemented / Yes / no | Implemented / Yes / No | Implemented / Yes / No |
| | | | | |
| | | | | |
| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | Acceptable | Tolerable | Unacceptable |
| ***"Action by who?"*** | | | | |
| ***"Action by when?"*** | | | | |
| **Notes** | | | | |
| **Updated on** | | | | |
| **Signature** | | | | |

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| **Activity/operation** | | **Maintenance** | **N°** | **30** |
| ***"What are the hazard?"*** | | **Improper use of equipment** | **Result** | **3B** |
| **Undesirable events** | | **Damage for the aircraft or the equipment** | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **04.** Little damage | **07.** Equipment damage | |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | **Clear instruction for the equipment** | **Clear instruction for the equipment** | |
| | | | | |
| **Assessment** | | | | |
| | **Severity** | **Negligible** | **Minor** | |
| | **Likelihood** | **Remote**<br>- It occurred in the company | **Remote**<br>- It occurred in the company | |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | | | |
| | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** |
| | | | | |
| | | | | |
| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** |
| ***"Action by who?"*** | | | | |
| ***"Action by when?"*** | | | | |
| **Notes** | | | | |
| **Updated on** | | | | |
| **Signature** | | | | |

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| **Activity/operation** | | **Maintenance** | **N°** | **31** |
| ***"What are the hazard?"*** | | **Panel or cap not closed** | **Result** | **2E** |
| **Undesirable events** | | **Problems during the plight test** | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **03.** Little injuries<br>**04.** Little damages | **01.** Serious injuries<br>**05.** Structural damages | **011.** Failure<br>**014.** Serious failure |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | **Double check** | **Double check** | **Double check** |
| | | | | |
| **Assessment** | | | | |
| | **Severity** | **Minor** | **Catastrophic** | **Hazardous** |
| | **Likelihood** | **Remote**<br>- It occurred in the company | **Improbable**<br>- It occurred in the history of aviation | **Improbable**<br>- It occurred in the history of aviation |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** |
| | | | | |
| | | | | |
| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** |
| ***"Action by who?"*** | | | | |
| ***"Action by when?"*** | | | | |
| **Notes** | | | | |
| **Updated on** | | | | |
| **Signature** | | | | |

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| **Activity/operation** | | **Maintenance** | | **N°** | **32** |
| ***"What are the hazard?"*** | | **Technician fatigue** | | **Result** | **2E** |
| **Undesirable events** | | **Fatigue can lead to errors and forgetfulness** | | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **011.** Failure<br>**03.** Little injuries<br>**015.** Need to re-do maintenance | **012.** Loss of the aircraft | **013.** Loss of the crew<br>**01.** Serious injuries | |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | Checks on the maximum worked hours<br>Do not accept works above the possibility of the personnel number<br>Double checks | Checks on the maximum worked hours<br>Do not accept works above the possibility of the personnel number<br>Double checks | Checks on the maximum worked hours<br>Do not accept works above the possibility of the personnel number<br>Double checks | |
| | | | | | |
| **Assessment** | | | | | |
| | **Severity** | Major<br>- An other maintenance intervention will be requested | Catastrophic | Catastrophic | |
| | **Likelihood** | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** | |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** | |
| | | | | | |
| | | | | | |
| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** | |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
| **Notes** | | | | | |
| **Updated on** | | | | | |
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|---|---|---|---|---|
| **Activity/operation** | | **Maintenance** | **N°** | **33** |
| ***"What are the hazard?"*** | | **New personnel in training** | **Result** | **2E** |
| **Undesirable events** | | **Errors due to no experience** | | |
| **Potential risks/outcomes**<br>***"Who can be harmed and how? What can be broken and how?"*** | | **011.** Failure<br>**03.** Little injuries<br>**015.** Need to re-do maintenance | **012.** Loss of the aircraft | **013.** Loss of the crew<br>**01.** Serious injuries |
| **Existent barrier or mitigation**<br>***"What are you already doing?*** | | Personnel in training is always supervised by an expert technician<br>Double checks | Personnel in training is always supervised by an expert technician<br>Double checks | Personnel in training is always supervised by an expert technician<br>Double checks |
| | | | | |
| **Assessment** | | | | |
| | **Severity** | Major<br>- Another maintenance intervention will be requested | Catastrophic | Catastrophic |
| | **Likelihood** | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** |
| **Further mitigation**<br>***"do you need to do anything else to control the risk?"*** | | **Implemented** / **Yes** / **no** | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** |
| | | | | |
| | | | | |
| **Final assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** |
| ***"Action by who?"*** | | | | |
| ***"Action by when?"*** | | | | |
| **Notes** | | | | |
| **Updated on** | | | | |
| **Signature** | | | | |

# ANNEX III

# Outcomes log and outcomes analysis

| N° | Outcome | Result of analysis | | |
|---|---|---|---|---|
| 1 | Serious injuries | 2C | → | 2B |
| 2 | Collision between people and aircraft | 2D | → | 2C |
| 3 | Little injuries | 3B | → | 3A |
| 4 | Little damages | 3A | → | 3A |
| 5 | Structural damages | 2E | → | 2D |
| 6 | Engine shut off or engine damage | 2B | → | 2B |
| 7 | Equipment damages | 3B | → | 3B |
| 8 | Collision with buildings | 2E | → | 2D |
| 9 | Environmental damage | 2C | → | 2B |
| 10 | Reputation damage | 2B | → | 2A |
| 11 | Failure | 2C | → | 2C |
| 12 | Loss of the aircraft | 2E | → | 2D |
| 13 | Loss of the crew | 2E | → | 2E |
| 14 | Serious failure | 2D | → | 2C |
| 15 | Need to re-do the maintenance | 2B | → | 2B |
| 16 | Delay in delivery | 2B | → | 2B |

| Outcome | | Serious injuries | | | N° | | 1 |
|---|---|---|---|---|---|---|---|
| *"What are the hazards who caused it?"* | | **H1.** Gathering people close to the parking plot, the landing or working zone<br>**H3.** Landing or working area surrounded by debris<br>**H6.** Time pressure<br>**H8.** Foreign Object Damage (FOD)<br>**H10.** Parking zone not protected and left open for access to all (vehicles, pedestrians, animals, etc.)<br>**H12.** Maintenance qualification or license expired<br>**H.13** Work documentation not understand by maintenance staff (translation)<br>**H17.** Use of not compliant parts (forgeries, repairs not inspected by a quality department, etc.) | | | Tolerability before the reactive control | | Result after the application of the reactive control |
| Assessment | | | | | | | |
| | Severity | Major | | | | | |
| | Likelihood | Improbable | | | | | |
| | Result | Acceptable | ~~Tolerable~~ | Unacceptable | 2C | → | 2B |

| Existent reactive controls<br>*"What are you already doing to react to this outcome?* | | Effective ERP<br><br>The collision will be considered an emergency that will activate the ERP | | |
|---|---|---|---|---|
| Assessment | | | | |
| | Severity | Minor | | |
| | Likelihood | Improbable<br>- It occurred in the history of aviation | | |
| | Result | ~~Acceptable~~ | Tolerable | Unacceptable |

| Further controls<br>*"Do you need to do anything else to control the outcome?"* | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Implemented | Yes | No | Implemented | Yes | No | Implemented | Yes | No |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Final assessment | | | | | | | | | | |
| | Severity | | | | | | | | | |
| | Likelihood | | | | | | | | | |
| | Result | Acceptable | | | Tolerable | | | Unacceptable | | |

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|---|---|
| *"Action by who?"* | |
| *"Action by when?"* | |
| Notes | |
| Updated on | |
| Signature | |

| Outcome | | Serious injuries | | | N° | | 1 |
|---|---|---|---|---|---|---|---|
| *"What are the hazards who caused it?"* | | **H19.** Lack of maintenance staff | | | Tolerability before the reactive control | | Result after the application of the reactive control |
| | | **H23.** Installation uncompleted | | | | | |
| | | **H25.** Damage during installation | | | | | |
| | | **H26.**Improper installation | | | | | |
| | | **H27.** Failure during the ignition or flight test | | | | | |
| | | **H28.** Error during failure detection | | | | | |
| | | **H29.** Degradation not found | | | | | |
| | | **H31.** Panel or cap not closed | | | | | |
| | | **H32.** Technician fatigue | | | | | |
| | | **H33.** New personnel in training | | | | | |
| Assessment | | | | | | | |
| | Severity | Major | | | | | |
| | Likelihood | Improbable | | | 2C | → | 2B |
| | Result | Acceptable | ~~Tolerable~~ | Unacceptable | | | |
| Existent reactive controls *"What are you already doing to react to this outcome?* | | Effective ERP | | | | | |
| | | The collision will be considered an emergency that will activate the ERP | | | | | |
| Assessment | | | | | | | |
| | Severity | Minor | | | | | |
| | Likelihood | Improbable<br>- It occurred in the history of aviation | | | | | |
| | Result | ~~Acceptable~~ | | Tolerable | | | Unacceptable |
| Further controls *"Do you need to do anything else to control the outcome?"* | | Implemented | Yes | No | Implemented | Yes | No | Implemented | Yes | No |
| | | | | | | | | | | |
| Final assessment | | | | | | | | | | |
| | Severity | | | | | | | | | |
| | Likelihood | | | | | | | | | |
| | Result | Acceptable | | Tolerable | | | Unacceptable | | | |
| *"Action by who?"* | | | | | | | | | | |
| *"Action by when?"* | | | | | | | | | | |
| Notes | | | | | | | | | | |
| Updated on | | | | | | | | | | |
| Signature | | | | | | | | | | |

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| **Outcome** | | **Collision between people and aircrafts** | | **N°** | **2** |
| ***"What are the hazards who caused it?"*** | | **H1.** Gathering people close to the parking plot, the landing or working zone<br>**H7.** Dangers linked to the rotors turning on the ground<br>**H10.** Parking zone not protected and left open for access to all (vehicles, pedestrians, animals, etc.) | | **Tolerability before the reactive control** | **Result after the application of the reactive control** |
| **Assessment** | | | | | |
| | **Severity** | **Hazardous** | | | |
| | **Likelihood** | **Improbable** | | | |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** | **2D** → **2C** |
| **Existent reactive controls**<br>***"What are you already doing to react to this outcome?*** | | **Effective ERP**<br>**The collision will be considered an emergency that will activate the ERP** | | | |
| **Assessment** | | | | | |
| | **Severity** | **Major** | | | |
| | **Likelihood** | **Improbable**<br>- **It occurred in the history of aviation** | | | |
| | **Result** | **Acceptable** | ~~**Tolerable**~~ | **Unacceptable** | |
| **Further controls**<br>***"Do you need to do anything else to control the outcome?"*** | | **Implemented** / **Yes** / **No** | | **Implemented** / **Yes** / **No** | **Implemented** / **Yes** / **No** |
| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** | |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
| **Notes** | | | | | |
| **Updated on** | | | | | |
| **Signature** | | | | | |

| Outcome | | Little injuries | | | N° | | 3 |
|---|---|---|---|---|---|---|---|
| *"What are the hazards who caused it?"* | | **H1.** Gathering people close to the parking plot, the landing or working zone<br>**H3.** Landing or working area surrounded by debris<br>**H4.** Landing zone or working area surrounded by obstacles<br>**H6.** Time pressure<br>**H7.** Dangers linked to the rotors turning on the ground<br>**H8.** Foreign Object Damage (FOD)<br>**H10.** Parking zone not protected and left open for access to all (vehicles, pedestrians, animals, etc.)<br>**H12.** Maintenance qualification or license expired<br>**H.13** Work documentation not understand by maintenance staff (translation)<br>**H16.** Main premises unsuitable (insufficient lighting, heating, sound proofing, protection against weather conditions)<br>**H17.** Use of not compliant parts (forgeries, repairs not inspected by a quality department, etc.) | | | Tolerability before the reactive control | | Result after the application of the reactive control |
| Assessment | | | | | | | |
| | Severity | Minor | | | | | |
| | Likelihood | Remote | | | | | |
| | Result | Acceptable | ~~Tolerable~~ | Unacceptable | 3B | → | 3A |

| Existent reactive controls<br>*"What are you already doing to react to this outcome?* | Firs aid kit and personnel trained to use it | | |
|---|---|---|---|
| | | | |
| Assessment | | | |
| Severity | Negligible | | |
| Likelihood | Remote | | |
| Result | ~~Acceptable~~ | Tolerable | Unacceptable |

| Further controls<br>*"Do you need to do anything else to control the outcome?"* | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Implemented | Yes | No | Implemented | Yes | No | Implemented | Yes | No |
| Final assessment | | | | | | | | | |
| Severity | | | | | | | | | |
| Likelihood | | | | | | | | | |
| Result | Acceptable | | | Tolerable | | | Unacceptable | | |

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|---|---|
| *"Action by who?"* | |
| *"Action by when?"* | |
| Notes | |
| Updated on | |
| Signature | |

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|---|---|---|---|---|---|
| **Outcome** | | **Little injuries** | **N°** | | **3** |
| *"What are the hazards who caused it?"* | | **H19.** Lack of maintenance staff | **Tolerability before the reactive control** | | **Result after the application of the reactive control** |
| | | **H20.** Fuel not adapted to the type of engine or use | | | |
| | | **H21.** Polluted fuel | | | |
| | | **H23.** Installation uncompleted | | | |
| | | **H25.** Damage during installation | | | |
| | | **H26.**Improper installation | | | |
| | | **H27.** Failure during the ignition or flight test | | | |
| | | **H28.** Error during failure detection | | | |
| | | **H29.** Degradation not found | | | |
| | | **H31.** Panel or cap not closed | | | |
| | | **H32.** Technician fatigue | | | |
| | | **H33.** New personnel in training | | | |
| **Assessment** | | | | | |
| | **Severity** | **Minor** | | | |
| | **Likelihood** | **Remote** | | | |
| | **Result** | **Acceptable** ~~**Tolerable**~~ **Unacceptable** | **3B** | → | **3A** |

| | | | | |
|---|---|---|---|---|
| **Existent reactive controls** *"What are you already doing to react to this outcome?* | | **Firs aid kit and personnel trained to use it** | | |
| **Assessment** | | | | |
| | **Severity** | **Negligible** | | |
| | **Likelihood** | **Remote** | | |
| | **Result** | ~~**Acceptable**~~ | **Tolerable** | **Unacceptable** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Further controls** *"Do you need to do anything else to control the outcome?"* | | **Implemented** | **Yes** | **No** | **Implemented** | **Yes** | **No** | **Implemented** | **Yes** | **No** |
| **Final assessment** | | | | | | | | | | |
| | **Severity** | | | | | | | | | |
| | **Likelihood** | | | | | | | | | |
| | **Result** | **Acceptable** | | | **Tolerable** | | | **Unacceptable** | | |
| *"Action by who?"* | | | | | | | | | | |
| *"Action by when?"* | | | | | | | | | | |
| **Notes** | | | | | | | | | | |
| **Updated on** | | | | | | | | | | |
| **Signature** | | | | | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Outcome** | | **Little damages** | | | **N°** | **4** |
| ***"What are the hazards who caused it?"*** | | **H2.** Birds<br>**H4.** Landing zone or working area surrounded by obstacles<br>**H9.** Absence or lack of markings, beacons on the ground<br>**H22.** Maintaining skill<br>**H23.** Pre-requisite for recruitment of technician<br>**H23.** Installation uncompleted<br>**H25.** Damage during installation<br>**H26.**Improper installation | | | **Tolerability before the reactive control** | **Result after the application of the reactive control** |
| **Assessment** | | | | | | |
| | **Severity** | Negligible | | | | |
| | **Likelihood** | Remote | | | | |
| | **Result** | ~~Acceptable~~ | **Tolerable** | **Unacceptable** | **3A** → | **3A** |
| **Existent reactive controls**<br>***"What are you already doing to react to this outcome?*** | | **Repair and controls after take off** | | | | |
| **Assessment** | | | | | | |
| | **Severity** | Negligible | | | | |
| | **Likelihood** | Remote | | | | |
| | **Result** | ~~Acceptable~~ | **Tolerable** | | **Unacceptable** | |
| **Further controls**<br>***"Do you need to do anything else to control the outcome?"*** | | **Implemented** | **Yes** | **No** | **Implemented** | **Yes** | **No** | **Implemented** | **Yes** | **No** |
| **Final assessment** | | | | | | | | | | |
| | **Severity** | | | | | | | | | |
| | **Likelihood** | | | | | | | | | |
| | **Result** | **Acceptable** | | | **Tolerable** | | | **Unacceptable** | | |
| ***"Action by who?"*** | | | | | | | | | | |
| ***"Action by when?"*** | | | | | | | | | | |
| **Notes** | | | | | | | | | | |
| **Updated on** | | | | | | | | | | |
| **Signature** | | | | | | | | | | |

| Outcome | | Structural damages | N° | 5 |
|---|---|---|---|---|
| *"What are the hazards who caused it?"* | | **H2.** Birds | Tolerability before the reactive control | Result after the application of the reactive control |
| | | **H4.** Landing zone or working area surrounded by obstacles | | |
| | | **H9.** Absence or lack of markings, beacons on the ground | | |
| | | **H23.** Installation uncompleted | | |
| | | **H25.** Damage during installation | | |
| | | **H26.**Improper installation | | |
| | | **H27.** Failure during the ignition or flight test | | |
| | | **H28.** Error during failure detection | | |
| | | **H29.** Degradation not found | | |
| | | **H31.** Panel or cap not closed | | |
| Assessment | | | | |
| | Severity | Catastrophic | | |
| | Likelihood | Improbable | 2E → | 2D |
| | Result | Acceptable ~~Tolerable~~ Unacceptable | | |

| Existent reactive controls *"What are you already doing to react to this outcome?* | | Effective ERP | Revision of some parts to limit the financial loss | |
|---|---|---|---|---|
| | | | | |
| Assessment | | | | |
| | Severity | Hazardous | Hazardous | |
| | Likelihood | Improbable<br>- It occurred in the history of aviation | Improbable<br>- It occurred in the history of aviation | |
| | Result | Acceptable | ~~Tolerable~~ | Unacceptable |

| Further controls *"Do you need to do anything else to control the outcome?"* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Implemented | Yes | No | Implemented | Yes | No | Implemented | Yes | No |
| Final assessment | | | | | | | | |
| | Severity | | | | | | | |
| | Likelihood | | | | | | | |
| | Result | Acceptable | | | Tolerable | | | Unacceptable | | |

| | |
|---|---|
| *"Action by who?"* | |
| *"Action by when?"* | |
| Notes | |
| Updated on | |
| Signature | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Outcome** | | **Engine shut off or engine damage** | | | **N°** | | **6** |
| ***"What are the hazards who caused it?"*** | | **H2.** Birds | | | **Tolerability before the reactive control** | | **Result after the application of the reactive control** |
| | | **H8.** Foreign Object Damage (FOD) | | | | | |
| | | **H20.** Fuel not adapted to the type of engine or use | | | | | |
| | | **H21.** Polluted fuel | | | | | |
| **Assessment** | | | | | | | |
| | **Severity** | Minor | | | | | |
| | **Likelihood** | Improbable | | | | | |
| | **Result** | ~~Acceptable~~ | **Tolerable** | **Unacceptable** | **2B** | → | **2B** |
| **Existent reactive controls** ***"What are you already doing to react to this outcome?*** | | Repair of engine before trying to start again after take off | | | | | |
| | | | | | | | |
| **Assessment** | | | | | | | |
| | **Severity** | Minor | | | | | |
| | **Likelihood** | Improbable | | | | | |
| | **Result** | ~~Acceptable~~ | **Tolerable** | | **Unacceptable** | | |
| **Further controls** ***"Do you need to do anything else to control the outcome?"*** | | | | | | | |
| | | **Implemented** | **Yes** | **No** | **Implemented** | **Yes** | **No** | **Implemented** | **Yes** | **No** |
| | | | | | | | | | | |
| | | | | | | | | | | |
| **Final assessment** | | | | | | | | | | |
| | **Severity** | | | | | | | | | |
| | **Likelihood** | | | | | | | | | |
| | **Result** | **Acceptable** | | | **Tolerable** | | | **Unacceptable** | | |
| ***"Action by who?"*** | | | | | | | | | | |
| ***"Action by when?"*** | | | | | | | | | | |
| **Notes** | | | | | | | | | | |
| **Updated on** | | | | | | | | | | |
| **Signature** | | | | | | | | | | |

| Outcome | | Equipment damages | | | N° | | 7 |
|---|---|---|---|---|---|---|---|
| *"What are the hazards who caused it?"* | | **H3.** Landing or working area surrounded by debris | | | Tolerability before the reactive control | | Result after the application of the reactive control |
| | | **H30.** Improper use of equipment | | | | | |
| Assessment | | | | | | | |
| | Severity | Minor | | | | | |
| | Likelihood | Remote | | | | | |
| | Result | Acceptable | ~~Tolerable~~ | Unacceptable | 3B | → | 3B |
| Existent reactive controls *"What are you already doing to react to this outcome?* | | Check of the working of equipment after the damage | | | | | |
| | | | | | | | |
| Assessment | | | | | | | |
| | Severity | Minor | | | | | |
| | Likelihood | Remote | | | | | |
| | Result | Acceptable | | ~~Tolerable~~ | | Unacceptable | |
| Further controls *"Do you need to do anything else to control the outcome?"* | | Implemented | Yes | No | Implemented | Yes | No | Implemented | Yes | No |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Final assessment | | | | | | | | | | |
| | Severity | | | | | | | | | |
| | Likelihood | | | | | | | | | |
| | Result | Acceptable | | | Tolerable | | | Unacceptable | | |
| *"Action by who?"* | | | | | | | | | | |
| *"Action by when?"* | | | | | | | | | | |
| Notes | | | | | | | | | | |
| Updated on | | | | | | | | | | |
| Signature | | | | | | | | | | |

| Outcome | | Collision with buildings | | | N° | | 8 |
|---|---|---|---|---|---|---|---|
| *"What are the hazards who caused it?"* | | **H5.** Landing zone or working area surrounded by populated area | | | Tolerability before the reactive control | | Result after the application of the reactive control |
| Assessment | | | | | | | |
| | Severity | Catastrophic | | | | | |
| | Likelihood | Improbable | | | 2E | → | 2D |
| | Result | Acceptable | ~~Tolerable~~ | Unacceptable | | | |
| Existent reactive controls *"What are you already doing to react to this outcome?* | | Effective ERP | | | | | |
| | | | | | | | |
| Assessment | | | | | | | |
| | Severity | Hazardous | | | | | |
| | Likelihood | Improbable<br>- It occurred in the history of aviation | | | | | |
| | Result | Acceptable | ~~Tolerable~~ | Unacceptable | | | |
| Further controls *"Do you need to do anything else to control the outcome?"* | | | | | | | |
| | | Implemented / Yes / No | | | Implemented / Yes / No | | Implemented / Yes / No |
| | | | | | | | |
| | | | | | | | |
| Final assessment | | | | | | | |
| | Severity | | | | | | |
| | Likelihood | | | | | | |
| | Result | Acceptable | Tolerable | Unacceptable | | | |
| *"Action by who?"* | | | | | | | |
| *"Action by when?"* | | | | | | | |
| Notes | | | | | | | |
| Updated on | | | | | | | |
| Signature | | | | | | | |

| Outcome | | Environmental damage | | | N° | | 9 |
|---|---|---|---|---|---|---|---|
| *"What are the hazards who caused it?"* | | **H5.** Landing zone or working area surrounded by populated area | | | Tolerability before the reactive control | | Result after the application of the reactive control |
| Assessment | | | | | | | |
| | Severity | Major | | | | | |
| | Likelihood | Improbable | | | 2C | → | 2B |
| | Result | Acceptable | ~~Tolerable~~ | Unacceptable | | | |
| Existent reactive controls *"What are you already doing to react to this outcome?* | | Effective ERP | | | | | |
| | | | | | | | |
| Assessment | | | | | | | |
| | Severity | Minor | | | | | |
| | Likelihood | Improbable<br>- It occurred in the history of aviation | | | | | |
| | Result | ~~Acceptable~~ | Tolerable | | Unacceptable | | |
| Further controls *"Do you need to do anything else to control the outcome?"* | | | | | | | |
| | | Implemented | Yes | No | Implemented | Yes | No | Implemented | Yes | No |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Final assessment | | | | | | | | | | |
| | Severity | | | | | | | | | |
| | Likelihood | | | | | | | | | |
| | Result | Acceptable | | | Tolerable | | | Unacceptable | | |
| *"Action by who?"* | | | | | | | | | | |
| *"Action by when?"* | | | | | | | | | | |
| Notes | | | | | | | | | | |
| Updated on | | | | | | | | | | |
| Signature | | | | | | | | | | |

| Outcome | | Reputation damage | | | N° | | 10 |
|---|---|---|---|---|---|---|---|
| *"What are the hazards who caused it?"* | | **H5.** Landing zone or working area surrounded by populated area<br>**H15.** Airworthiness certificate or equivalent not up-to-date or missing | | | Tolerability before the reactive control | | Result after the application of the reactive control |
| Assessment | | | | | | | |
| | Severity | Major | | | | | |
| | Likelihood | Improbable | | | | | |
| | Result | Acceptable | ~~Tolerable~~ | Unacceptable | 2B | → | 2A |
| Existent reactive controls<br>*"What are you already doing to react to this outcome?* | | Information campaign to inform the customers and the population about the safety policy of the company | | | | | |
| | | | | | | | |
| Assessment | | | | | | | |
| | Severity | Minor | | | | | |
| | Likelihood | Improbable | | | | | |
| | Result | ~~Acceptable~~ | | Tolerable | | | Unacceptable |
| Further controls<br>*"Do you need to do anything else to control the outcome?"* | | | | | | | |
| | | Implemented / Yes / No | | | Implemented / Yes / No | | Implemented / Yes / No |
| | | | | | | | |
| | | | | | | | |
| Final assessment | | | | | | | |
| | Severity | | | | | | |
| | Likelihood | | | | | | |
| | Result | Acceptable | | Tolerable | | | Unacceptable |
| *"Action by who?"* | | | | | | | |
| *"Action by when?"* | | | | | | | |
| Notes | | | | | | | |
| Updated on | | | | | | | |
| Signature | | | | | | | |

| Outcome | | Failure | N° | 11 |
|---|---|---|---|---|
| *"What are the hazards who caused it?"* | | **H6.** Time pressure<br>**H7.** Dangers linked to the rotors turning on the ground<br>**H8.** Foreign Object Damage (FOD)<br>**H12.** Maintenance qualification or license expired<br>**H.13** Work documentation not understand by maintenance staff (translation)<br>**H16.** Main premises unsuitable (insufficient lighting, heating, sound proofing, protection against weather conditions)<br>**H17.** Use of not compliant parts (forgeries, repairs not inspected by a quality department, etc.)<br>**H19.** Lack of maintenance staff<br>**H22.** Maintaining skill | Tolerability before the reactive control | Result after the application of the reactive control |
| Assessment | | | | |
| | Severity | Major | | |
| | Likelihood | Improbable | | |
| | Result | Acceptable ~~Tolerable~~ Unacceptable | 2C → | 2C |

| Existent reactive controls<br>*"What are you already doing to react to this outcome?* | Inspection and maintenance intervention on the aircraft after the failure | | |
|---|---|---|---|
| | | | |
| Assessment | | | |
| Severity | Major | | |
| Likelihood | Improbable | | |
| Result | Acceptable | ~~Tolerable~~ | Unacceptable |

| Further controls<br>*"Do you need to do anything else to control the outcome?"* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Implemented | Yes | No | Implemented | Yes | No | Implemented | Yes | No |
| | | | | | | | | | |
| Final assessment | | | | | | | | | |
| Severity | | | | | | | | | |
| Likelihood | | | | | | | | | |
| Result | Acceptable | | | Tolerable | | | Unacceptable | | |

| | |
|---|---|
| *"Action by who?"* | |
| *"Action by when?"* | |
| Notes | |
| Updated on | |
| Signature | |

| Outcome | | Failure | N° | 11 |
|---|---|---|---|---|
| *"What are the hazards who caused it?"* | | **H23.** Pre-requisite for recruitment of technician | Tolerability before the reactive control | Result after the application of the reactive control |
| | | **H23.** Installation uncompleted | | |
| | | **H25.** Damage during installation | | |
| | | **H26.**Improper installation | | |
| | | **H27.** Failure during the ignition or flight test | | |
| | | **H28.** Error during failure detection | | |
| | | **H29.** Degradation not found | | |
| | | **H31.** Panel or cap not closed | | |
| | | **H32.** Technician fatigue | | |
| | | **H33.** New personnel in training | | |
| Assessment | | | | |
| | Severity | Major | | |
| | Likelihood | Improbable | | |
| | Result | Acceptable ~~Tolerable~~ Unacceptable | 2C → | 2C |

| Existent reactive controls *"What are you already doing to react to this outcome?* | Inspection and maintenance intervention on the aircraft after the failure | | |
|---|---|---|---|
| | | | |
| Assessment | | | |
| Severity | Major | | |
| Likelihood | Improbable | | |
| Result | Acceptable | ~~Tolerable~~ | Unacceptable |

| Further controls *"Do you need to do anything else to control the outcome?"* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Implemented | Yes | No | Implemented | Yes | No | Implemented | Yes | No |
| | | | | | | | | | |
| | | | | | | | | | |
| Final assessment | | | | | | | | | |
| Severity | | | | | | | | | |
| Likelihood | | | | | | | | | |
| Result | Acceptable | | | Tolerable | | | Unacceptable | | |

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|---|---|
| *"Action by who?"* | |
| *"Action by when?"* | |
| Notes | |
| Updated on | |
| Signature | |

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|---|---|---|---|---|---|
| **Outcome** | | **Loss of the aircraft** | **N°** | | **12** |
| ***"What are the hazards who caused it?"*** | | **H6.** Time pressure | **Tolerability before the reactive control** | | **Result after the application of the reactive control** |
| | | **H8.** Foreign Object Damage (FOD) | | | |
| | | **H12.** Maintenance qualification or license expired | | | |
| | | **H.13** Work documentation not understand by maintenance staff (translation) | | | |
| | | **H19.** Lack of maintenance staff | | | |
| | | **H32.** Technician fatigue | | | |
| | | **H33.** New personnel in training | | | |
| **Assessment** | | | | | |
| | **Severity** | Catastrophic | | | |
| | **Likelihood** | Improbable | **2E** | → | **2D** |
| | **Result** | Acceptable ~~Tolerable~~ Unacceptable | | | |
| **Existent reactive controls** ***"What are you already doing to react to this outcome?*** | | Revision of some parts to limit the financial loss | | | |
| | | | | | |
| **Assessment** | | | | | |
| | **Severity** | Hazardous | | | |
| | **Likelihood** | improbable | | | |
| | **Result** | Acceptable | ~~Tolerable~~ | | Unacceptable |
| **Further controls** ***"Do you need to do anything else to control the outcome?"*** | | | | | |
| | | Implemented / Yes / No | Implemented / Yes / No | | Implemented / Yes / No |
| | | | | | |
| | | | | | |
| **Final assessment** | | | | | |
| | **Severity** | | | | |
| | **Likelihood** | | | | |
| | **Result** | Acceptable | Tolerable | | Unacceptable |
| ***"Action by who?"*** | | | | | |
| ***"Action by when?"*** | | | | | |
| **Notes** | | | | | |
| **Updated on** | | | | | |
| **Signature** | | | | | |

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|---|---|---|---|---|---|
| **Outcome** | | **Loss of the crew** | | **N°** | **13** |
| ***"What are the hazards who caused it?"*** | | **H6.** Time pressure | | **Tolerability before the reactive control** | **Result after the application of the reactive control** |
| | | **H19.** Lack of maintenance staff | | | |
| | | **H32.** Technician fatigue | | | |
| | | **H33.** New personnel in training | | | |
| | | | | | |
| | | | | | |
| **Assessment** | | | | | |
| | **Severity** | Catastrophic | | | |
| | **Likelihood** | Improbable | | | |
| | **Result** | Acceptable | ~~Tolerable~~ | Unacceptable | **2E** → **2E** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Existent reactive controls** ***"What are you already doing to react to this outcome?*** | | | | | | | | |
| | | | | | | | | |
| **Assessment** | | | | | | | | |
| | **Severity** | | | | | | | |
| | **Likelihood** | | | | | | | |
| | **Result** | **Acceptable** | | **Tolerable** | | **Unacceptable** | | |
| **Further controls** ***"Do you need to do anything else to control the outcome?"*** | | **Implemented** | **Yes** | **No** | **Implemented** | **Yes** | **No** | **Implemented** | **Yes** | **No** |
| | | | | | | | | | | |
| | | | | | | | | | | |
| **Final assessment** | | | | | | | | | | |
| | **Severity** | | | | | | | | | |
| | **Likelihood** | | | | | | | | | |
| | **Result** | **Acceptable** | | | **Tolerable** | | | **Unacceptable** | | |
| ***"Action by who?"*** | | | | | | | | | | |
| ***"Action by when?"*** | | | | | | | | | | |
| **Notes** | | | | | | | | | | |
| **Updated on** | | | | | | | | | | |
| **Signature** | | | | | | | | | | |

| Outcome | | Serious failure | N° | 14 |
|---|---|---|---|---|
| *"What are the hazards who caused it?"* | | **H8.** Foreign Object Damage (FOD)<br>**H17.** Use of not compliant parts (forgeries, repairs not inspected by a quality department, etc.)<br>**H23.** Installation uncompleted<br>**H25.** Damage during installation<br>**H26.**Improper installation<br>**H27.** Failure during the ignition or flight test<br>**H28.** Error during failure detection<br>**H29.** Degradation not found<br>**H31.** Panel or cap not closed | Tolerability before the reactive control | Result after the application of the reactive control |
| Assessment | | | | |
| | Severity | Hazardous | | |
| | Likelihood | Improbable | | |
| | Result | Acceptable ~~Tolerable~~ Unacceptable | 2D → | 2C |

| Existent reactive controls *"What are you already doing to react to this outcome?* | | Revision of some parts to limit the financial loss | | |
|---|---|---|---|---|
| | | | | |
| Assessment | | | | |
| | Severity | Major | | |
| | Likelihood | improbable | | |
| | Result | Acceptable | ~~Tolerable~~ | Unacceptable |

| Further controls *"Do you need to do anything else to control the outcome?"* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Implemented | Yes | No | Implemented | Yes | No | Implemented | Yes | No |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Final assessment | | | | | | | | | | |
| | Severity | | | | | | | | | |
| | Likelihood | | | | | | | | | |
| | Result | Acceptable | | | Tolerable | | | Unacceptable | | |

| *"Action by who?"* | |
|---|---|
| *"Action by when?"* | |
| Notes | |
| Updated on | |
| Signature | |

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|---|---|---|---|---|---|---|
| **Outcome** | | **Need to re-do the maintenance** | | **N°** | | **15** |
| ***"What are the hazards who caused it?"*** | | **H14.** Work documentation not up-to-date<br>**H16.** Main premises unsuitable (insufficient lighting, heating, sound proofing, protection against weather conditions)<br>**H17.** Use of not compliant parts (forgeries, repairs not inspected by a quality department, etc.)<br>**H22.** Maintaining skill<br>**H23.** Pre-requisite for recruitment of technician<br>**H25.** Damage during installation<br>**H26.**Improper installation<br>**H32.** Technician fatigue<br>**H33.** New personnel in training | | **Tolerability before the reactive control** | | **Result after the application of the reactive control** |
| **Assessment** | | | | | | |
| | **Severity** | **Minor** | | | | |
| | **Likelihood** | **Improbable** | | **2B** | → | **2B** |
| | **Result** | ~~Acceptable~~ | **Tolerable** | **Unacceptable** | | |

| | | | | |
|---|---|---|---|---|
| **Existent reactive controls**<br>***"What are you already doing to react to this outcome?*** | | | | |
| **Assessment** | | | | |
| | **Severity** | | | |
| | **Likelihood** | | | |
| | **Result** | **Acceptable** | **Tolerable** | **Unacceptable** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Further controls**<br>***"Do you need to do anything else to control the outcome?"*** | | | | | | | | |
| | **Implemented** | **Yes** | **No** | **Implemented** | **Yes** | **No** | **Implemented** | **Yes** | **No** |
| **Final assessment** | | | | | | | | |
| | **Severity** | | | | | | | |
| | **Likelihood** | | | | | | | |
| | **Result** | **Acceptable** | | **Tolerable** | | | **Unacceptable** | | |

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|---|---|
| ***"Action by who?"*** | |
| ***"Action by when?"*** | |
| **Notes** | |
| **Updated on** | |
| **Signature** | |

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|---|---|---|---|---|---|---|---|
| **Outcome** | | **Delay in delivery** | | | **N°** | | **16** |
| ***"What are the hazards who caused it?"*** | | **H15.** Airworthiness certificate or equivalent not up-to-date or missing | | | **Tolerability before the reactive control** | | **Result after the application of the reactive control** |
| | | **H18.** Detection of anomalies in the manufacturers documentation | | | | | |
| | | **H19.** Lack of maintenance staff | | | | | |
| | | | | | | | |
| **Assessment** | | | | | | | |
| | **Severity** | **Minor** | | | | | |
| | **Likelihood** | **Improbable** | | | | | |
| | **Result** | ~~Acceptable~~ | **Tolerable** | **Unacceptable** | **2B** | → | **2B** |
| **Existent reactive controls** ***"What are you already doing to react to this outcome?*** | | | | | | | |
| | | | | | | | |
| **Assessment** | | | | | | | |
| | **Severity** | | | | | | |
| | **Likelihood** | | | | | | |
| | **Result** | **Acceptable** | | **Tolerable** | | **Unacceptable** | |
| **Further controls** ***"Do you need to do anything else to control the outcome?"*** | | | | | | | |
| | | **Implemented** | **Yes** | **No** | **Implemented** | **Yes** | **No** | **Implemented** | **Yes** | **No** |
| | | | | | | | | | | |
| | | | | | | | | | | |
| **Final assessment** | | | | | | | | | | |
| | **Severity** | | | | | | | | | |
| | **Likelihood** | | | | | | | | | |
| | **Result** | **Acceptable** | | | **Tolerable** | | | **Unacceptable** | | |
| ***"Action by who?"*** | | | | | | | | | | |
| ***"Action by when?"*** | | | | | | | | | | |
| **Notes** | | | | | | | | | | |
| **Updated on** | | | | | | | | | | |
| **Signature** | | | | | | | | | | |

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